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VOLUME IX.—No. 1

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BY

C. E. C. FISCHER, I.F.S.

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A SURVEY OF THE FLORA OF THE ANAIMALAI HILLS IN THE COIMBATORE DISTRICT, MADRAS PRESIDENCY.

BY

C. E. C. FISCHER, I.F.S.

GENERAL ACCOUNT.

Topography. The area covered by the following survey lies between 76°43′ and 77°26′ E. and 10°13′ and 10°32′ N. It forms the mass of hills known as the Coimbatore Anaimalais. They are continuous with the vast range of mountains that runs southwards through the Travancore State. On the West they are cut off from the Neliampatti Hills by the valley of the Tekkadi river and on the East from the Palni Hills by the valley of the Puchaiar. The northern slopes descend precipitously to the plains of Central Coimbatore. The range is separated from the Aiyamalai and Bolampatti Hills, which connect on to the Nilgiri Hills, by the break in the Western Ghats known as the "Palghat gap" which is about 20 miles wide.

The elevations vary from about 900 feet above mean sea-level, in the north-eastern corner, and about 1,200 feet in the north-western corner to 8,244 feet (Thanakumalai Peak, see plate IV) in the centre.

The range is divided into approximately equal eastern and western halves by the Torakadavu stream, which, rising close to the Travancore frontier at Chindalindamalai, runs in a northerly direction to flow into the Ali-ar near the northern boundary of our area. The Ali-ar forms a considerable water fall into the plains and thence flowing westwards empties itself into the Ponani river near Palghat and eventually into the Indian Ocean a little south of Calicut.

The central mass of the range is the highest, rising to over 7,000 feet on either side of the Torakadavu and diminishing gradually East and West. In the East the Amaravati river flows northwards out of Travancore, cutting off a narrow belt of low hills between it and its tributary the Puchai-ar. The elevations along the Amaravati run from 900 to 1,500 feet. East of the Amaravati the peaks do not exceed 3,300 feet. To the West the fall is more or less continuous to the Tekkadi river, and to the Periyar further South, where the elevation is about 1,500 feet.

To the South there is no clear topographical feature dividing the tract under survey from the Travancore ranges which culminate with Anaimudi Peak, the highest point in Southern India with an elevation of approximately 8,800 feet.

The higher hills are quite trackless, except for occasional game paths. In the dense evergreen woods one has to cut a way at the expense of considerable labour and it is very easy to lose one's sense of direction in these featureless forests.

With the exception of three roads, running more or less north and south, and the system of roads within the plantations, the communications do not permit of wheeled traffic. The conveyance of baggage has to be arranged for either by elephants or by porterage.

Roughly two-fifths of the area drains eastwards into the Bay of Bengal by the Channel of the Amaravati river and its tributaries, itself an affluent of the Kaveri. The remainder sends its waters into the Indian Ocean, either, as already detailed, by way of the Ali-ar or through the Tekkadi-ar, Periyar and Sholai-ar, all three of which flow through the State of Cochin.

Geology. The geological formation is metamorphic, the rock being granitic gneiss. The absence of lime is remarkable.

The soils vary from extremely poor and shallow, especially in the dry eastern region where they have been subjected to much wash and erosion, to extremely rich and deep in the moister localities and where age-long virgin forest has occupied and enriched the land.

The soil in the moist, deciduous western forests is very clayey and apt to become water-logged in the low-lying places.

The planting zone, between 3,000 and 5,000 feet, where the median evergreen type of forests prevails, has a rich porous soil, full of organic matter.

There are large expanses of bare rock; here a few hardy plants manage to exist in the fissures where small accumulations of soil and debris have lodged.

Rainfall and Climate. There are remarkable variations in the rainfall and the climate with regard to the smallness of the area comprised (about 43 miles from east to west and an average of 12 miles from north to south).

The hills intercept the south-west monsoon winds that sweep across the Cochin forests, consequently the rainfall on the south-western slopes is considerable, averaging from 120 to 150 inches in the year. On the north-west the Neliampatti Hills have already taken toll of the rain clouds and

the fall recorded at Mount Stuart (2,250 feet) averages but 60 inches. On the higher ranges in the central massif the precipitation is again higher but no record of the actual fall is available. At Attakatti (3,000 feet) at the centre of the northern slopes the average is about 80 inches. Towards the East precipitation diminishes very rapidly and on the plains near the "débouchement" of the Amaravati the fall is only 18 inches, the greater part of which is received during the north-east monsoon in October and November. In the central and western parts the rains begin usually before the middle of June and the heaviest fall is in July; somewhat less is received in August and comparatively little in September, between the two monsoons. In the latter half of October and the first half of November heavy precipitation again occurs. From December to June only occasional showers are experienced yielding only a few inches for the whole period.

The temperature curve is the reverse of that which indicates the rainfall, that is to say, subject to the influence of elevation, the temperature is high where the rainfall is low and low where the fall is great.

On the high-level plateaus the temperature is delightful in the warm and dry months and distinctly cold and bracing from December to February, but the climate is marred by frequent dense, chilly mists.

The whole range has a bad reputation for malarial fever. As usual, this is an exaggeration, but undoubtedly the foot of the hills and the lower valleys are to be avoided, especially in the dry season, from March to May.

Hill tribes. Four distinct tribes of hill-men inhabit the Anaimalais. The Kadirs are probably the best known outside the locality since they are the most primitive and the most interesting ethnologically. Among them the front teeth of the males are filed to a point when they reach adolescence. As a general rule they have no settled abodes or definite villages. They wander from place to place in the evergreen forests, according to season, moved by the dates of maturity of the several wild products they live on: fruits, roots, honey, etc. Temporary dwellings are constructed wherever convenient; bamboo huts with watertight roofs of leaves or grass for the rainy season and for the dry weather mere lean-to shelters consisting of parallelogramic frames of bamboo, thatched with leaves or grass, supported at a steep slope by a couple of rough posts.

Their cultivation is limited and primitive, being confined to small patches of *Eleusine coracana* Gaertn. in temporary clearings along streams. They are much addicted to the practice of opium eating.

The Pulaiyas are a less unsophisticated and less pleasant race; very lazy and very dirty. They have permanent villages which, however, are

moved every few years to follow their shifting cultivation, or abandoned in haste with the appearance of epidemic diseases.

They, like the next race, cultivate several crops : *Andropogon Sorghum* Brot., *Eleusine coracana* Gaertn., *Amarantus paniculatus* Linn., and *Ipomoea Batatas* Poir. They are also suspected of growing "Ganja" (*Cannabis sativa* Linn.), the cultivation of which is prohibited, but no real evidence ofthis is forthcoming.

They will eat the flesh of the Indian Bison (Gaur) which neither the Kadirs nor the Muduvas will touch, as the latter hold that animal in some reverence as being of the nature of a bull or cow, in spite of which they will assist the sportsman in stalking these fine beasts ; once killed, however, they will not approach within 5 yards of the carcase.

The Malasas are similar in many ways to the Pulaiyas but are in closer contact with the people of the plains, often living close to them and performing agricultural labour and other servitude for them. They will not, however, move far from the foot of the hills.

Finally, the Muduvas, who hold themselves as the aristocracy of the hills and occupy among these hill tribes a position analogous to that of the Brahmins among the Hindus. They are supposed to be descendants of plains people who fled to the hills before the Mahomedan invaders of Tippoo. They are somewhat cleaner, more intelligent and more industrious than the other tribes, but otherwise do not materially differ from them in mode of life.

There is also a small settlement of Irulas near Paralai, but these people were brought over from the Nilgiris for work on coffee plantations.

Fauna. As implied by the name of the range (Anaimalai is a literal Tamil translation of Elephant Hill) the Indian elephant abounds in these hills. They are little molested and have become a source of anxiety to the planters and cultivators and are frequently dangerous to human life. A few are captured every year in pits by the officers of the Forest Department, but this does not affect their numbers perceptibly.

The Indian Bison or Gaur (*Gaviæus gaurus*) is common both in the lower moist forests and on the high grassy downs, where it grazes almost side by side with large herds of the Nilgiri goat (*Hemitragus hylocrius*).

Tigers are not very common, but panthers are more frequent and black specimens are not rare.

Other animals of interest to the sportsman are : the sambar, spotted-deer, sloth bear, wild dog, often met in very large packs, wild pig and mouse deer. Small game is not at all abundant.

Among snakes of special interest may be mentioned the hamadryad (*Naia bungarus*) of which a specimen 11′ 9½″ long was killed at Attakatti,

the keeled viper (*Echis carinata*), the common Indian coral snake (*Hemibungarus nigrescens*), *Ancistrodon hypnale*, several pit vipers, including the Anamallay Viper (*Lachesis anamallensis*) and Russell's Viper (*Vipera russellii*), all of which are more or less poisonous. The cobra, of course, is also fairly common outside the evergreen portions. In the drier tracts the molurus python occurs. Crocodiles are found in the Amaravati river, but do not attain any great size. The Indian monitor is common in the damper parts and is prized by the hill-men as a delicate comestible.

Produce plantations. Coffee planting was first started in the Anaimalais about the middle of the 19th century. The then estates were limited to a few small areas on the northern slopes, reached by a tortuous and steep bridle path and a shorter but steeper footpath. About 1896 the far more suitable south-western slopes, forming the catchment areas of the Periyar and Sholaiar were thrown open to the planting industry. From that date very considerable areas of the magnificent evergreen forests have been cleared to make room for coffee, tea, rubber to a small extent, cardamoms and a little Cinchona. There is now a very thriving planting district lying about the point known as Valparai between elevations of 3,000 and 5,000 feet to which access is gained by a remarkable ghat road of many "hair-pin" turns that runs up from the plains to the north (*see* plate 1).

Botanical history.—The oldest records of botanical investigation that I have been able to trace are to be found in the reports of the visits made by Captain (later General) J. Michael in October 1851, Lieutenant (afterwards Colonel) W. Beddome and Dr. H. Cleghorn in 1857 and 1858. All three investigators were pioneer Forest Officers and their reports were framed rather from that standpoint than from that of botanical research. As might be expected, the floristic information is meagre and vague, especially in the case of Michael who was a soldier, a pioneer forester, and a mighty hunter but not a botanist.

No doubt Beddome and Cleghorn recorded botanical notes but I am not aware of any such records devoted solely to this tract. I have included in the general list appended a couple of species quoted by Cleghorn in his "Forests and Gardens of Southern India" which have not been mentioned by others as having been observed in these hills, nor have they been observed by me. Beddome's notes are to be found in his "Flora Sylvatica," "Ferns of Southern India" and "Ferns of British India."

Lawson must have visited the Anaimalais, but I have seen no record of his observations there. Dr. Robert Wight resided for several years in Coimbatore (about 38 miles north of the tract), but there is no evidence of

his having visited the range, which is not mentioned in his and Arnott's "Prodromus." Though his authority is quoted in the "Flora of British India" for the occurrence of several species in the Anaimalai Hills it is quite possible that the specimens concerned were collected for him by others; certainly Captain Cotton, R.E., must have provided him with some and probably Michael also.

Dr. C. A. Barber, C.I.E., as Government Botanist, paid one or two visits to our area and officers subordinate to him were also deputed for collecting work from time to time. Rai Bahadur K. Ranga Chariar, the present Lecturing Botanist at the Agricultural College at Coimbatore, has kindly furnished me with a list of the plants recorded during these expeditions and they are incorporated in my list.

My own acquaintance with the Anaimalais dates from 1911. I was in forest charge of the South Coimbatore Forest Division, which includes these hills, from December 1911 to September 1915 and I paid two or three subsequent visits to the western extremity. Every opportunity was taken during my official tours to collect botanical specimens and to take notes. The majority of the specimens obtained were sent to the herbarium of the Royal Botanic Garden, Calcutta.

Sources of information.—No previous attempt at a survey of the flora of the Anaimalai Hills appears to have been made. The present one is based mainly on my own notes and collections, but, for the sake of such completeness as is possible at present, I have scrutinised every published work that seemed likely to afford additional information and have obtained lists, as already stated, from the Agricultural College Herbarium. The sources from which information has been derived are acknowledged in the list for those species which I have not observed.

I am conscious that the list is still far from complete. This is due firstly to the shortcomings of my own observations, as official duties prevented as thorough an exploration of all parts at all seasons as I should have desired. Secondly there is no published botanical work (or unpublished that I am aware of) devoted solely to the Anaimalai Hills, and those I have been able to consult cover the whole of the Madras Presidency or even larger areas, if they refer to our area at all. In many cases our restricted area is not specifically quoted as one of the habitats though, no doubt, it is included in the general limits stated. I have thought it safer to include only such plants as are stated definitely to have been found in the Anaimalais. On the other hand, I have included a few on the authority of Beddome with some hesitation, since that author apparently included the Nellampatti Hills in the Anaimalais as testified by such sentences

as: "Anaimalais, head of ghat from Palghat to Neliampatti Coffee Estates." The two ranges are separated, however, by so little that it seems very unlikely that any species found in the Neliampattis should be absent from all parts of our area. The converse does not hold good as the former hills are entirely within the Malabar region and much nearer the West Coast of the Peninsula, and there is no intrusion of any semi-desert type of vegetation.

The following published works were consulted:—

1. Wight and Arnott	"Prodromus Florae Peninsulae Indiae Orientalis."
2. H. Cleghorn	"Forests and Gardens of Southern India."
3. W. Beddome	"Flora Sylvatica."
4. Do.	"Ferns of Southern India."
5. Do.	"Ferns of British India."
6. Sir J. D. Hooker	"Flora of British India."
7. Do.	"A Sketch of the Flora of British India."
8. Do.	"Epitome of the British Indian Species of Impatiens (Records of the Botanical Survey of India, Vol. IV)."
9. J. S. Gamble	"Flora of the Presidency of Madras (up to and including Leguminoseae)."
10. P. F. Fyson	"Flora of the Nilgiri and Palni Hill Tops."

Nomenclature.—I have adopted the nomenclature given in T. Cooke's "Flora of the Presidency of Bombay," Gamble's "Flora of the Presidency of Madras" (up to Aquifoliaceae only) and Fyson's "Flora of the Nilgiri and Palni Hill Tops" where these differ from the Flora of British India, but the latter, in such cases, has been quoted within brackets.

The second fascicle of Gamble's work quoted above appeared after the appended list had been completed. It would have entailed very considerable scriptory work to have incorporated the additional species (30) and the nomenclature, and I have thought it best to furnish these in a separate list (Appendices A and B). The additional species and genera have been included, however, in the synoptical table and notes.

Vernacular names.—The use of vernacular names, except for very restricted areas is full of pitfalls. The difficulties and drawbacks have been

exceedingly well expressed by Wight and Arnott in the preface to their "Prodromus" and as I thoroughly agree with their conclusions, I have given, with a very few exceptions, only such vernacular names as I have myself obtained and tested in the Anaimalais. The exceptions are those names to be found in Beddome's "Flora Sylvatica" when they refer beyond doubt to our area.

Character of the Flora.—The flora of the Anaimalais partakes of both the Malabar and the Dekkan regions, as described by Sir J. D. Hooker in his "Sketch of the Flora of British India" in the Imperial Gazetteer.

The first is represented in the evergreen forests and their vicinity in the zones of heavy rainfall.

The Coromandel sub-region of the Dekkan region is found in the inextensive, low-lying tract in the eastern extremity; and the Mysore sub-region on the northern, fairly dry slopes between 1,000 and 1,500 feet, especially in the eastern half.

The vegetation falls into five fairly district types, with sub-types in two of them. These types and sub-types are apt to intrude into one another and to merge on their common confines, so that it is rarely possible to fix hard and fast limits.

Working from the plains upwards the types are as follows :—

1. The dry, semi-desert type, which occupies the low eastern region in the Amaravati valley and extends more or less along the foot of the hills between elevations of 900 and 1,500 feet. The rainfall averages from 18 to 21 inches (see Plate I).

It is characterised by such plants as :—

Cocculus pendulus Diels, *Polycarpaea corymbosa* Lam., *Portulaca Wightiana* Wall. (among rocks), *Paronia procumbens* Boiss., *Commiphora Berryi* Engl., *Pyrenacanthus volubilis* Hook. f., *Vitis quadrangularis* Wall., *Rothia trifoliata* Pers., *Crotalaria medicaginea* Lam., *Indigofera marginulata* Grah., *Pterolobium indicum* A. Rich., *Acacia Latronum* Wild., *Acacia planifrons* W. & A., *Dichrostachys cinerea* W. & A., *Vahlia viscosa* Roxb., an abundance of *Opuntia Dillenii* How., *Gisekia pharnaceoides* Linn., *Coffea Wightiana* W. & A., *Sphæranthus amaranthoides* Burm., *Mimusops hexandra* Roxb., *Salvadora persica* Linn., *Heliotropium zeylanicum* Lam., *Solanum trilobatum* Linn., *Barleria noctiflora* Linn. f., *Geniosporum prostratum* Benth., *Euphorbia dracunculoides* Lam., *Euphorbia antiquorum* Linn., *Hemicyclia sepiaria* W. & A., *Jatropha Wightiana* Muell.-Arg., *Perotis latifolia* Ait., and *Oropetium Thomæum* Trin.

Along streams the following species belonging to other types and elevations intrude :

Hopea parviflora Bedd., *Acacia Suma* Kurz., *Calamus Rotang* Linn.

2. The dry, deciduous hill type, on the outer slopes in the drier regions, from 1,500′ to 3,500′. The rainfall varies from 20 to 60 inches per annum.

The slopes are usually very rocky and precipitous (see Plate I). Along the ravines and in other favourable places species of the next type are apt to intrude. The characteristic species of this type are :—

Cochlospermum Gossypium DC., *Shorea Talura* Roxb., *Sterculia urens* Roxb., *Eriolaena quinquelocularis* Wight., *Buettneria herbacea* Roxb., *Hiptage Madablota* Gaertn., *Murraya exotica* Linn., *Elaeodendron glaucum* Pers., *Sapindus bifoliatus* Hiern., *Buchanania Lanzan* Spreng., *Indigofera Wightii* Grah., *Indigofera pulchella* Roxb., *Butea frondosa* Roxb., *Dalbergia sissoides* Grah., *Albizzia odoratissima* Benth., *Kalanchoe floribunda* W. & A., *Rubia cordifolia* Linn., *Diospyros montana* Roxb., *Olea dioica* Roxb., *Didymocarpus Rottleriana* Wall., *Vitex altissima* Linn. f., *Lasiosiphon eriocephalus* Dene. (above 3,000′), *Givotia rottleriformis* Griff., *Ficus Arnottiana* Miq., *Manisurus granularis* Linn. and *Andropogon Nardus* Linn.

This type is often found occupying areas that formerly were covered with evergreen vegetation and that have been degraded by shifting cultivation and annual firing.

3. The moist, deciduous forest type. This type is almost confined to the western extremity, between elevations of 1,500 and 2,500 feet, with a rainfall of from 50 to 100 inches (see Plate II). It borders on and mixes with the lower evergreen type (see Plate III).

This is the most important type from the point of view of the forester, since it is here that timber trees, such as *Tectona grandis* Linn., *Pterocarpus Marsupium* Roxb., *Dalbergia latifolia* Roxb., *Terminalia tomentosa* Bedd., *Lagerstroemia lanceolata* Wall., attain their largest dimensions. In spite of very wasteful and extensive extractions in the past, enormous examples of these and other species are still to be met with. Apart from this the most prominent feature of this region is the prevalence of *Bambusa arundinacea* Willd., which has invaded large areas and threatens the extinction of all other vegetation. Here too, in clearings and along communications, *Lantana Camara* Linn. has appeared and spread so extensively that special means of repression have had to be adopted.

Besides those mentioned above the following distinguish this type :—

Naravelia zeylanica DC., *Dillenia pentagyna* Roxb., *Hibiscus Lampas* Cav., *Sterculia villosa* Roxb., *Impatiens chinensis* Linn., *Naregamia alata* W. & A., *Melia composita* Willd., *Vitis discolor* Dalz., *Schleichera trijuga* Willd., *Semecarpus Anacardium* Linn., *Crotolaria dubia* Grah., *Desmodium*

Cephalotes Wall., *Desmodium pulchellum* Benth. (the last two forming thickets under the large trees), *Desmodium triquetrum* DC., *Desmodium gyrans* DC., *Spatholobus Roxburghii* Benth., *Caesalpinia mimosoides* Lam., *Bauhinia malabarica* Roxb., *Xylia dolabriformis* Benth., (*X. xylocarpa?*), *Terminalia paniculata* Roth. *Careya arborea* Roxb. *Mussænda frondosa* Linn., *Embelia Tsjeriam-Cottam* A. DC., *Scoparia dulcis* Lam., *Aeginetia indica* Roxb., *Stereospermum chelonoides* DC., *Antidesma Ghesambilla* Gaertn., *Baliospermum axillare* Bl., *Cycas circinalis* Linn., *Habenaria plantaginea* Lindl., a number of *Scitaminaceae* including *Costus speciosus* Sm., and *Clinogyne virgata* Benth. (the latter forming dense thickets near water), *Dioscorea oppositifolia* Linn., *Chloris incompleta* Roth., and *Drynaria quercifolia* Linn. (on tree trunks and on rocks).

In the swamps one meets with *Sesbania aculeata* Pers., *Randia uliginosa* DC., *Sphenoclea zeylanica* Gaertn., *Hydrolea zeylanica* Vahl. and *Ceratopteris thalictroides* Linn., and along streams *Rhabdia lycioides* Mart. grows.

4. The evergreen type, with a rainfall of 100 to 150 inches per annum, is divisible into three fairly distinct sub-types, which correspond roughly with the elevation.

(*a*) The lower evergreen sub-type ranging from 1,500 to 3,000 feet (see Plate III). Some of its characteristic species are:—

Hydnocarpus Wightiana Bl., *Xanthophyllum flavescens* Roxb., *Ancistrocladus Heyneanus* Wall., *Achrongchia laurifolia* Bl., *Harpullia imbricata* Thw., *Geophila reniformis* D. Don., *Bragantia Wallichii* Br., *Croton caudatus* Giesel., *Dimorphocalyx Lawianus* Hook. f., *Excœcaria robusta* Hook. f., *Panicum pilipes* Nees., and the reed-like bamboo *Ochlandra travancorica* Benth., which last densely covers considerable areas along streams. It is the leaves of this bamboo that are generally used by the jungle men for thatching.

(*b*) The median evergreen sub-type, lying between 3,000 and 5,000 feet.

This is the best class of land for the purposes of the planting industry and several thousand acres of magnificent evergreen forest have been cleared to make room for coffee and tea plantations and partially cleared for the cultivation of cardamoms.

Rubber trees of several kinds have been tried but without much commercial success. Pepper vines are trained to a certain extent on the shade trees in some of the coffee plantations and there is also some Cinchona grown.

Gigantic evergreen trees grow in these forests. Some of them, such as *Mesua ferrea* Linn., *Calophyllum tomentosum* Wight., *Palaquium ellipticum* Engl., and *Diospyros Ebenum* Koen. are of value to the timber trade.

This sub-type is probably the most varied and botanically interesting of the area. The vegetation is exceedingly densely grown, so that, except where some fallen giant stem has made a temporary opening, sunlight never reaches the soil.

There are four well defined stories: Lofty trees, with their crowns out in the sunlight, overtop all, some 140 or 150 feet above the ground. Besides those already mentioned one may quote: *Cullenia excelsa* Wight., *Elaeocarpus tuberculatus* Roxb., *Canarium strictum* Roxb., *Kurrimia bipartita* Laws., and *Nephelium Longana* Camb.

Beneath these, smaller trees adapt themselves to the more shady conditions and form a second story. Of these the most characteristic are:—

Unona pannosa Dalz., *Goniothalamus Wightii* Hook. f. & T., several Garcinias, *Holigarna Beddomei* Hook. f., *Pithecolobium bigemminum* Benth., *Eugenia Munroii* Wight., *Isonandra lanceolata* Wight., *Premna coriacea* C. B. Clarke, *Agrostistachys longifolia* Benth., and *Macaranga tomentosa* Wight. The last named together with *Clerodendron infortunatum* Linn. (which here reaches to a height of 30 feet) are the first trees to appear as secondary growth on neglected clearings.

Innumerable woody shrubs from the next stage, such as:—*Paramignya armata* Oliv., *Turraea villosa* Burm., *Ixora nigricans* Br., *Psychotria Thwaitesii* Hook. f., *Psychotria anamallayana* Bedd., *Saprosma indicum* Dalz., *Ervatamia coronaria* Stapf., several species of *Strobilanthes*, which are often overgrown by *Cassytha filiformis* Linn., and *Chloranthus brachystachyus* Bl.

Twining among these and often binding them to form an almost impenetrable mass, are such twiners as *Lavunga eleutherandra* Dalz. *Erythropalum populifolium* Mast. and *Rhaphidophora pertusa* Schott.

Occasionally there are canebrakes of *Calamus pseudotenuis* Becc.

Finally, below all, there is a carpet of herbs and cryptogams, including:—

Several species of *Impatiens*, *Sonerila*, *Brunonis* W. & A., *Acranthera anamallica* Bedd., *Neurocalyx Wightii* Arn., *Ophiorrhiza hirsutella* Wight., *Isanthera permollis* Nees., *Pilea stipulosa* Miq., *Gymnopteris contaminans* Wall., and *Selaginella plumosa* Baker. Old rotted stumps afford lodging for mosses and smaller ferns and masses of *Nephrolepis cordifolia* Linn. The soil under this covering consists mainly of the decomposed and decomposing debris of all this vegetation and affords the shelter beloved of leeches. These animals are a perfect pest, if not a danger, during the wet season. As an Indian subordinate officer once reported of forests of this type: "The attacks of elephants and leeches are too much."

Epiphytic orchids and ferns cluster on the trunks of the trees, mosses clothe them and lichens disguise them; an occasional *Fagraea ovata* Wall. or *Connarus Wightii* Hook. f. is festooned among the branches and the flowers of *Aeschyananthus Perottetii* A. DC., here and there, lend a touch of brighter colour.

Where the soil is poor or shallow the trees of the tallest story are either absent or reduced in size and only three stories are present. Here the tree Composite, *Vernonia monosis* Benth. appears.

Further features of interest in this zone are the tree ferns (*Alsophila*), the *Podostemoniaceae* on semi-submerged rocks in the streams, the justly dreaded "Elephant-nettle," *Laportea crenulata* Gaud., and the only South Indian Conifer, *Podocarpus latifolia* Wall., though this latter is rare in these hills.

(*c*) The upper evergreen sub-type, above 5,000 feet.

This type occurs both in continuous expanses of forest (see Plate IV) and in isolated patches punctuating the open grass lands of the next type (see Plate V). These latter patches usually surround and line the depressions and ravines that form the sources of streams.

The margins of the forests of this type are generally extraordinarily abrupt where they border on grass land, giving the appearance of a wall across the open downs.

In these forests we find:—*Michelia nilagirica* Zenk., *Mahonia Leschenaultii* Tak., *Eurya japonica* Thunb., *Elæocarpus ferrugineus* Wight., *Apodytes Benthamiana* Wight., *Euonymus indicus* Heyne., 3 species of *Ilex*, species of *Microtropis*, *Turpinia pomifera* DC., *Pithecolobium subcoriaceum* Thw., 3 species of *Rubus* (mainly along the outer edges and in glades), *Eugenia Arnottiana* Wight., *Eugenia calophyllifolia* Wight., *Rhodomyrtus tomentosa* Wight., *Medinella Beddomei* C. B. Clarke (? *M. fuchsioides* Gard.), *Polyscias acuminata* Seem., *Senecio corymbosus* Wall., *Gaultheria fragrantissima* Wall. (along the margins), *Rhododendron arboreum* Sm., *Ardisia rhomboidea* Wight., *Symplocos anamallayana* Bedd., *Cinnamomum Wightii* Meissn., *Pilea Wightii* Bedd., *Cirrhopetalum Gamblei* Hook. f., *Aerides radicosum* A. Rich., *Peliosanthes neilgherrensis* Wight., and *Arisaema tortuosum* Schott.

The curious little epiphyte *Impatiens Jerdoniae* Wight. is common at the higher elevations, as also the small parasite *Viscum japonicum* Thunb., especially on *Eurya japonica* Thunb. and *Rhododendron arboreum* Sm.

5. The grass-land type, running from 3,000 feet to the highest points. Here again a division according to elevation is required. The limit between the two sub-types is not at all well defined but can be fixed with rough approximation at 6,000 feet. The lower sub-type is often dotted

with single trees or groups of *Terminalia Chebula* Retz., *Zizyphus rugosa* Lam., and *Mallotus albus* Muell.-Arg., while the upper sub-type is invaded by patches of the upper evergreen sub-type.

The slopes are usually steep, except where small plateaus occur when the ground undulates more or less gently to the edge of rocky precipices or passes gradually to the steeper lower slopes.

(*a*) The lower grass-land sub-type, below 6,000 feet, is distinguished by 2 species of *Viola*, *Linum mysorense* Heyne, *Crotolaria Wightiana* Br., *Desmodium rufescens* DC., *Flemingia Grahamiana* DC., *Drosera Burmannii* Vahl., *Bupleurum mucronatum* Wall., *Centratherum molle* Benth., *Conyza stricta* DC., *Laggera alata* Schultz-Bip., *Lobelia nicotianaefolia* Heyne., *Campanula fulgens* Wall., *Swertia affinis* C. B. Clarke, *Æginetia pedunculata* Wall., *Osyris arborea* Wall., 3 species of *Burmannia*, *Ischaemum ciliare* Retz., *Andropogon Nardus* Linn., *Pteris aquilina* Linn., *Lycopodium cernuum* Linn., and *Selaginella rupestris* Spreng (on rocks).

(*b*) The upper grass-land sub-type, above 6,000 feet (see Plates IV and V), contains a number of species of sub-alpine affinity. Of these may be mentioned *Hypericum japonicum* Thunb., *Polygala sibirica* Linn., *Geranium nepalense* Sweet, *Impatiens oppositifolia* Linn., *Indigofera pedicellata* W. & A., *Fragaria indica* And., *Osbeckia Leschenaultiana* DC., *Peucedanum anamallayanum* Bedd., *Hedyotis articularis* Br., *Hedyotis buxifolia* Bedd., *Valeriana Hookeriana* W & A., *Dipsacus Leschenaultii* Coult., *Vernonia Bourneana* W. W. Smith, *Anaphalis Meeboldii* W. W. Smith, *Lysimachia Leschenaultii* Duby, *Jasminum bignoniaceum* Wall., *Pedicularis zeylanica* Benth., *Strobilanthes Kunthianus* T. And., *Micromeria biflora* Benth., *Calamintha umbrosa* Benth., *Leucas lanceaefolia* Desf., *Polygonum alatum* Ham., *Rumex nepalensis* Spreng., *Spiranthes australis* Lindl., *Lilium neilgherrense* Wight., *Isachne Gardneri* Benth., and *Arundinella Wightiana* Nees.

In swampy places occur:—*Ranunculus reniformis* Wall., *Drosera peltata* Sm., *Serpicula indica* Thw., *Gentiana quadrifariâ* Bl., several species of *Utricularia*, *Satyrium nepalense* Don., several species of *Eriocaulon*, *Carex phacota* Spreng., and *Athyrium Filix-foemina* Bernh.

Along streams we find *Anemone rivularis* Ham., *Impatiens Tangachee* Bedd., the beautiful *Sonerila grandiflora* Wall., and *Exacum atro-purpureum* Bedd. VAR. *anamallayanum* Bedd., *Arundinaria Wightiana* Nees. and *Osmunda regalis* Linn.

General observations. The flora of the Anaimalais, therefore, is varied, perhaps extraordinarily so for so small an area. Those to whom

the neighbouring hills and plains are familiar will remark that it does not differ very greatly from that of its surroundings. The most noteworthy features are :

The absence from the semi-desert type of the spinous *Dalbergius* and of *Cassia marginata* Roxb., all of which are common in the adjoining Madura District.

In the higher grass lands *Cotoneaster buxifolia* Wall., *Rosa Leschenaultiana* W. & A. and *Parochetus communis* Ham., all common in similar localities in the Nilgiri and Palni Hills are entirely wanting as far as my observations go. On the other hand, *Anaphalis Meeboldii* W. W. Smith is exceedingly common on the Tanakumalai ridge (about 8,000 feet), and lower down we get *Impatiens herbicola* Hook. f., both of which species were discovered by Meebold in Travancore in 1911 and, as far as I am aware, have not been reported from any other than these two localities.

In the median evergreen sub-type or on grass land close to its edges *Podocarpus latifolia* Wall. is found. Elsewhere it is known only from the Travancore and Tinnevelly Hills far to the south.

Another uncommon plant is *Utleria salicifolia* Bedd. Of recent years it has been found outside the Anaimalais in another range of Coimbatore hills. It is a gregarious shrub, not a tree as stated in the Flora of British India, not exceeding 6 feet in height and a ground level diameter of 1½ inches. It is found in rocky places near evergreen forest between elevations of 4,000 and 5,000 feet.

Pyrenacantha volubilis Hook., a slender climber apparently not reported from any part of India up to the time Vol. I of the Flora of British India was published in 1875 and since then recorded only from the Palni and Tinnevelli Hills (*vide* J. S. Gamble's "Flora of the Presidency of Madras"), occurs in the semi-desert type of our area. It may be of interest to note that I have also found this species in the northern part of the Nellore District, at least 350 miles north of the Anaimalais, and also on the coast line of that District (Sriharikota) within 5 miles of the Bay of Bengal.

A number of lichens are to be found on the trunks and branches of trees and on soil in the wetter parts and adhering to rocks at the higher elevations. Liverworts are also common in sheltered and damp places. As them find place in this review.

Subsequent to the compilation of the General list below and after the preceding notes had been written, the second part of Mr. J. S. Gamble's "Flora of the Presidency of Madras" was published. From this part I have extracted 28 species not included in the list, and two varieties are

therein promoted to specific rank. Further there are changes in nomenclature. At about the same time the Revd. Father E. Blatter and Dr. Hallberg published the first part of "A Review of the Indian Species of Rotala" in Vol. XXV (pp. 709 *et seq.*) of the Journal of the Bombay Natural History Society. In this review there are two or three alterations in nomenclature and one new species from the Anaimalais, which turns out to be identical with 2 unnamed specimens in my collections.

I proposed at first to incorporate these additions and changes in my list. To have done so, however, would have entailed much scriptory labour and the expenditure of more time than I could afford; consequently, I have decided to include them in appendices. I was all the more reconciled to this compromise by the reflection that further additions and alterations may be expected with the issue of the subsequent parts of Mr. Gamble's Flora and possibly also in the concluding part of the revision of the species of Rotala. These additions are taken into account, however, in the synoptical analysis.

This probability of further additions makes any synopsis of the numbers of families, genera and species of doubtful value. Nevertheless, for the sake of completeness, I append some notes and a synoptical table for what they are worth at this stage.

Introduced species that have run wild. The following is a not quite exhaustive list of species that have been introduced and have run wild. The number prefixed to each denotes its position in the general list:

624. *Opuntia Dillenii* Haw. Very abundant and gregarious in the low dry parts.

728. *Erichtethes valerianaefolia* DC. Common in some of the plantations.

767. *Flaveria Contrayerba* Pers. In the drier parts, not very abundant.

778. *Tridax procumbens* Linn. Very abundant almost everywhere in open places up to 3,000'.

779. *Cosmos caudatus* H. B. K. In some plantations, not common.

970. *Ipomoea coccinea* Linn. Near Mount Stuart.

1002. *Lycopersicum esculentum* Mill. Along the ghat road leading to the plantations.

1004. *Physalis peruviana* Linn. Not particularly abundant.

1006. *Nicandra physalioides* Gaertn. About hill villages.

1026. *Scoparia dulcis* Linn. In the moist western deciduous forest only.

1059. *Martynia diandra* Glox. In open places, mostly near the foot of the hills.

1129. *Bromellia demissa* Linn. A rare escape.

1130. *Lantana Camara* Linn. In the moist western region.

1358. *Jatropha Curcas* Linn. Near villages.

1425. *Pilea muscosa* Lindl. In the plantations.

Synopsis. From all sources to which I have had access I have drawn out the list given further on which contains 1,828 species, excluding the mosses and fungi of which the list is very incomplete. Of these about 1,500 have been derived from my own notes and the rest from one or more of the authorities quoted.

There are only 3 Gymnosperms *viz.*—

Gnetum scandens Roxb., *Podocarpus latifolia* Wall., and *Cycas circinalis* Linn.

Only one family, the Leguminosae, is represented by over 100 species (177) the next being the Euphorbiaceæ with 91.

Two genera are represented by more than 20 species; *Crotalaria* with 32 and *Impatiens* with 26.

Synoptical table.

Division.	Number of Families.	Number of Genera.	Number of Species.
I Phanerogamia	140	765	1,690
A. Dicotyledones	116	640	1,473
1. Polypetalæ	63	286	679
(a) Thalamifloræ	22	81	178
(b) Discifloræ	18	94	180
(c) Calycifloræ	23	111	321
2. Gamopetalæ	33	253	546
3. Monochlamydæ	20	101	248
B. Gymnospermæ	3	3	3
C. Monocotyledones	21	122	214
II Cryptogamia	9	60	138
Total	149	825	1,828

Explanation of abbreviations, etc. In the following list the numbers entered immediately after the specific names are those of my collections sent to the Herbarium of the Royal Botanic Garden, Sibpur, and identified there.

As already stated, when the nomenclature adopted differs from that employed in the Flora of British India the latter is added within brackets.

For those species not seen in the area by myself I have noted invariably the authority for inclusion immediately after the specific name. For this purpose the following abbreviations have been used :

F. B. I. for Sir J. D. Hooker's "Flora of British India."

Cleg. for Dr. H. Cleghorn's "Forests and Gardens of Southern India."

F. S. for Col. Beddome's "Flora Sylvatica."

Ferns for his "Ferns of British India" and "Ferns of Southern India."

F. P. M. for Mr. J. S. Gamble's "Flora of the Presidency of Madras."

A. C. for Lists furnished by Rao Bahadur M. R. Ry. K. Ranga Chariar Avgl., Lecturing Botanist.

The dates of flowering, fruiting etc., are extracted from my own notes; the other observations are also from my note books, except when inverted commas show that they are quoted from the sources indicated.

In conclusion I desire to acknowledge the very kind assistance extended by Lt.-Col. A. T. Gage, I.M.S., and his assistants at the Calcutta Herbarium, Messrs. W. W. Smith, C. C. Calder, M. S. Ramaswami and P. Debburman, who compared my collections, checked and corrected my identifications and answered my tiresome questions with unfailing courtesy and promptitude.

I have also to thank Rao Bahadur M. R. Ry. K. Ranga Charia and his assistants at Coimbatore for the identification of some of the Graminaceæ; Mr. J. S. Gamble, C.I.E., F.R.S., for the identification of a few other specimens; Mr. W. Macrae, Government Mycologist, for naming most of the fungi and Miss E. Wakefield of Kew who named two of the latter.

Text for Plates.

Plate I—page 12.—The Anaimalai Ghat Road; section between 1,200′ and 1,500′. Passing through the dry semi-desert and the dry deciduous hill types.

Plate II—page 13.—The Tunakadavu falls near Mount Stuart. Moist, deciduous forest type 2,000′.

Plate III—page 13.—Karanir. Moist, deciduous forest type (left foreground) meeting lower evergreen sub-type (across the stream).

Plate IV—page 17.—From left to right: Thanakumalai (8,244′), Akkamalai (about 8,100′) and Tangachimalai (7,200′). The Torakadavu valley at the foot of the peaks. Upper evergreen and Upper grass-land sub-types.

Plate V—page 18.—Camp at Koramparai swamp 7,500′. Baggage elephants just outside wood on left. Upper grass-land sub-type with patch of upper evergreen sub-type; a swamp immediately below the wood, from which issues a perennial stream.

SYSTEMATIC LIST.

PHANEROGAMIA.

DICOTYLEDONEAE.

1. RANUNCULACEAE.

1. Clematis L.

1. C. smilacifolia Wall.
Flowers May. In evergreen forest, 4,000′.

2. C. Munroana Wight. F. P. M.

3. C. Gouriana Roxb. No. 3250.
Flowers December to January, 3,000′.

2. Naravelia DC.

4. N. zeylanica DC.
Flowers and fruits November to January, 2,500′—3,500′.

3. Anemone L.

5. A. rivularis Ham. No. 3345.
Flowers and fruits April—May, 6,000′—7,500′.

4. Thalictrum L.

6. T. javanicum Bl.
Flowers May. Over 6,000′.

5. Ranunculus L.

7. R. reniformis Wall.
Flowers April—May, 6,000′—7,500′.

8. R. Wallichianus W. & A.
Flowers April, 6,000′—7,000′.

II. DILLENIACEAE.

6. Dillenia L.

9. **D. retusa** Thunb. F. P. M.

10. **D. pentagyna** Roxb. No. 3367. Tamil *Nai-tek, Ponnai.*
Flowers March—April; leafless when flowering; fruits April—May. In the deciduous forests of the western half. 1,600′—3,300′.

11. **D. bracteata** Wight. (*Wormia bracteata* Hook f. & T.) F. S.

III. MAGNOLIACEAE.

7. Michelia L.

12. **M. Champaca** L. A. C.
In evergreen forest, 4,000′.

13. **M. nilagirica** Zenk.
Flowers May. In evergreen forest 6,000′—7,000′.

IV. ANONACEAE.

8. Sageræa Dalz.

14. **S. Dalzelii** Bedd. F. S.

9. Uvaria L.

15. **U. zeylanica** L. F. S.

16. **U. Narum** Wall. No. 3742.
Flowers December—May. Only seen at Lower Punachi at 2,800′.

10. Cyathocalyx Champ.

17. C. zeylanicus Champ. F. S.
3,000′.

11. Unona L.

18. U. pannosa Dalz. No. 3593.
Flowers May. In dense evergreen forest, 2,500′—4,500′.

19. U. viridiflora Bedd. F. P. M. and A. C.
In evergreen forest, 3,000′.

12. Polyalthia Bl.

20. P. fragrans Bedd. F. S.
"In moist forests, scarce; 3,000′."

21. P. cerasoides Hook. f. & T. Tamil *Nullilai*.
Flowers May to July; fruits August to September. Throughout the lower slopes, 1,000—2,500′.

22. P. coffeoides Benth. & Hook. f. Cleg.

13. Goniothalamus Bl.

23. G. cardiopetalus Hook. f. & T. F. P. M. and A. C.
In evergreen forest at about 4,000′.

24. G. Wightii Hook f. & T. No. 3592. Irula. *Korangupilla*.
Flowers May. In dense evergreen forest, 4,000′.

14. Mitrephora Bl.

25. M. Heyneana Thw. No. 3439. Tamil *Kugamatti*.
Flowers and Fruits May. In the dry eastern belt, 1,500′—2,000′.

15. Miliusa Lesch.

26. M. eriocarpa Dunn. (*M. indica* Hook. f. & T. VAR. *tomentosa*) No. 3606.
Flowers May, 4,500′.

27. **M. montana** Gardn. (*M. indica* Hook. f. & T. VAR. *montana*) F. P. M.

28. **M. nilagirica** Bedd. F. P. M.

16. Saccopetalum Benn.

29. **S. tomentosum** Hook. f. & T. Tamil *Karimthumbai*.
Flowers and new leaves in March. 1,200′—3,000′.

17. Alphonsea Hook. f. & T.

30. **A. madraspatana** Bedd No. 3435. Pulaiya *Thuttamaram*.
Flowers May. In the dry eastern section; 1,500′.

31. **A. sclerocarpa** Thw. Tamil *Kothiviran*.
Fruits November. In the dry eastern section; 1,200′.

32. **A. zeylanica** Hook. f. & T. A. C.
4,000′.

18. Orophea Bl.

33. **O. erythrocarpa** Bedd. F. S.
2,000.

34. **O. Thomsoni** Bedd. F. P. M.

V. MENISPERMACEÆ.

19. Tinospora Miers.

35. **T. cordifolia** Miers. No. 3642.
Flowers February to September. From the plains to 2,000′.

20. Diploclisia Miers.

36. **D. glaucescens** Diels (*Cocculus macrocarpus* W. & A.) No. 3360.
Kadir *Vallipilachi*.
Flowers March. In and near evergreen forest; 2,000′—3,000′.

21. Cocculus DC.

37. C. laurifolius DC. No. 3400.
Flowers April—May. 4,000′—5,000′. (F. S. 7,000′.)

38. C. hirsutus Diels (*C. villosus DC.*)
Flowers January—February. Along the foot of the hills.

39. C. pendulus Diels (*C. Leaeba DC.*) No. 3682. Tamil *Villumbi.*
Flowers March. At the lowest elevations in the dry eastern belt.

22. Stephania Lour.

40. S. japonica Miers. (*S. hernandifolia* Walp.) No. 3625.
Flowers May to July; fruits August. 1,700′—3,000′.

23. Cissampelos L.

41. C. Pareira L. Tamil *Urikakodi.*
Flowers July to September; fruits January. Common. 900′—2,500′.

24. Cyclea Arn.

42. C. peltata Diels. (*C. Burmannii* Hook. f. & T.) Nos. 3641, 3769.
Flowers September—October; fruits October. In the moist deciduous forests of the west; 1,800′—2,500′.

43. C. Arnotti Miers. (*C. peltata* Hook. f. & T.) F. P. M.

25. Pachygone Miers.

44. P. ovata Miers.

Flowers May—June. 1,000′—1,500′.

VI. BERBERIDACEÆ.

26. Mahonia Nutt.

45. M. Leschenaultii Tak. (*Berberis nepalensis* Spreng.)
Fruits March—April. In evergreen forest above 6,000′.

27. Berberis L.

46. B. tinctoria Lesch. (*B. aristata* DC. in part.)
Young fruits May. Seen only in the eastern half in grass lands over 6,000′.

VII. CRUCIFERÆ.

28. Cardamine L.

47. C. hirsuta L.
Flowers and fruits January. In evergreen forest; 3,300′.

VIII. CAPPARIDACEÆ.

29. Cleome L.

48. C. monophylla L.
Flowers and fruits December to July. In the drier parts; 1,000′—2,500′.

49. C. aspera Koen.
Flowers and fruits June—July. Along the foot of the hills. The upper leaves are frequently trifoliate by suppression.

50. C. viscosa L.
Flowers and fruits December to July. On dry slopes; 1,000′—1,800′.

30. Gynandropsis DC.

51. G. pentaphylla DC.
Flowers May. In the dry eastern belt; 900′.

31. Maerua Forsk.

52. M. arenaria Hook. f. & T. No. 3685.
Flowers February; fruits in the hot weather. 900′—1,200′.

32. Cratæva L.

53. C. religiosa Forst.
Flowers April. 1,000′—2,000′. In favourable localities attains a considerable size; 50′ in height and 5′ in girth.

33. Cadaba Forsk.

54. C. Indica Lam.
Flowers February to September; fruits July to December. In dry localities; 900′—1,700′.

34. Capparis L.

55. C. Heyneana Wall.
Flowers May. 1,500′.

56. C. Moonii Wight. A. C.
In evergreen forest at about 3,000′.

57. C. grandis L.
Flowers May—June. 900′—1,400′.

58. C. sepiaria L.
Flowers May—June; fruits September. In the dry eastern region; 1,000′—1,700′.

59. C. zeylanica L. (*C. horrida* L.)
Flowers September. 1,000′—1,500′.

60. C. fusifera Dunn. A. C.
In evergreen forest at about 3,000′.

IX. VIOLACEÆ.

35. Viola L.

61. V. Patrinii DC.
Flowers March—April. In woods and open grass lands over 4,000′.

62. V. serpens Wall.
Flowers March—April; fruits April—May. In similar situations as the last.

36. Ionidium Vent.

63. I. suffruticosum Ging.
Flowers and fruits throughout the year. 900′—2,500′.

X. BIXACEÆ.

37. Cochlospermum Kunth.

64. C. Gossypium DC. Tamil *Kudraipuduku-mara, Kat-olaga*; Pulaiya *Kokamara*.
Flowers December to February (sometimes up to May); leafless while flowering; fruits March—June. Very conspicuous when in flower. Common on dry rocky slopes from 1,200′—4,000′.

38. Scolopia Schreb.

65. S. crenata DC. No. 3347.
Flowers April. In evergreen forest; 4,000′—6,500′.

39. Flacourtia Commers.

66. F. montana Grah.
In evergreen forest, 4,500′.

40. Hydnocarpus Gærtn.

67. H. Wightiana Bl. No. 3368. Kadir *Vetti-maram, Yetti-maram*.
Flowers April; fruits October. Common in evergreen forest, 2,000′—3,000′

68. H. alpina Wight. Nos. 3549, 3712. Pulaiya *Billu-mara.*
Flowers February to April; fruits March to May. In and near evergreen forest; 2,800′—4,500′.

XI. PITTOSPORACEÆ.

41. Pittosporum Banks.

69. P. tetraspermum W. & A.
Flowers April. In evergreen forest above 6,000′.

70. P. floribundum W. & A. No. 3,602.
Flowers April—May. At about 4,000′.

XII. POLYGALACEÆ.

42. Polygala L.

71. P. arillata Ham. Pulaiya *Sholaitathi-chedi.*
Flowers and fruits April. In evergreen forest; 4,000′—6,500′. Not as common in our area as in the Nilgiris, Billigiri Rangaus or the Palnis.

72. P. javana DC.
Flowers and fruits May. 4,400′.

73. P. chinensis L.
Flowers and fruits October. Fairly common from the plains up to 2,000′.
Var. **triflora** L. No. 3480.
Flowers and fruits September. At Tekkadi 1,700′.

74. P. sibirica L.
Flowers and fruits April—May. Common on the grassy downs above 6,500′.

43. Xanthopyllum Roxb.

75. X. flavescens Roxb.
Flowers and fruits April—May. Fairly common in evergreen forests; 1,800′—3,000′.

XIII. CARYOPHYLLACEÆ.

44. Cerastium L.

76. C. indicum W. & A. F. P. M.

45. Stellaria L.

77. S. media L.
Flowers and fruits January. 4,000′.

46. Polycarpæa L.

78. P. corymbosa Lam.
Flowers May to December; fruits December to February. Along the foot of the hills and rising to 3,500′.

XIV. PORTULACACEÆ.

47. Portulaca L.

79. P. oleracea L.
Flowers and fruits October-December. 1,200′—3,000′.

80. P. Wightiana Wall. No. 3612.
Flowers June-December. In the drier parts at the lower elevations.

81. P. quadrifida L.
Flowers and fruits throughout the year. Very common and widespread. 900′—4,000′.

82. P. suffruticosa Wight.
Flowers and fruits February and June. On rocky slopes in the eastern region; 1,500′—2,000′.

48. Talinum Adans.

83. T. cuneifolium Willd. No. 3791.

Flowers and fruits February. Seen only in the Dalli Reserved Forest near the eastern extremity; 1,000′.

XV. HYPERICACEÆ.

49. Hypericum L.

84. H. mysorense Heyne.
Flowers and fruits March to May. Above 4,000′.

85. H. japonicum Thunb.
Flowers and fruits March to May. 6,300′ and above.

XVI. GUTTIFERÆ.

50. Garcinia L.

86. G. Cambogia Desrouss. Nos. 3431, 3350.
Flowers April—May; fruits September—October. In evergreen forests and along streams; 1,500′—6,300′.

87. G. Morella Desrouss.
Flowers April. In evergreen forest on the Travancore frontier; 6,500′.

88. G. Wightii T. Anders. A. C.
" In evergreen forest at about 4,000′."

89. G. tinctoria Dunn. (*G. Xanthochymus* Hook. f.) No. 3387.
Flowers March—April. In evergreen forest at about 4,000′.

90. G. spicata Hook. f. (*G. ovalifolia* Hook. f.) A. C.
In evergreen forest at about 4,000′.

51. Calophyllum L.

91. C. elatum Bedd. (*C. tomentosum* T. Anders.) Tamil *Pongu*, Irula *Sakla-maram*.
Flowers May. In evergreen forest at about 4,000′.

92. C. decipiens Wight. (*C. Wightianum* Wall.) Kadir *Analviri*, Pulaiya *Atukungiliam*.

Fruits May—June. Along river banks; 1,000′—4,000′.

93. C. trapezifolium Thw. A. C.
"In evergreen forest at about 4,000′."

52. Mesua L.

94. M. ferrea L. Tamil *Suruli*; Pulaiya *Atu-ponnai*.
Flowers April-May; fruits October to December. Common in the evergreen forests from 2,300′—4,500′. The leaves are very variable, as also the size of the flowers and seem to form distinct varieties, as described in Bourdillon's "Trees of Travancore." Of his three varieties I have found two on the Anamalais.

Var. 1. Flowers 3″—4″ in diameter; leaves long lanceolate, 6″—8″ long.

Var. 2. Flowers 1″ in diameter; leaves elliptic, sub-candate, 3″—4″ by $1\frac{1}{8}$″.

53. Pœciloneuron Bedd.

95. P. indicum Bedd. A. C.
"In evergreen forest at about 3,400′."

XVII. TERNSTRŒMIACEÆ.

54. Eurya Thunb.

96. E. japonica Thunb.
Fruits April—May. Along the edges of evergreen woods and of streams in open grass lands above 7,000′.

55. Gordonia Ellis.

97. G. obtusa Wall. No. 3605.
Flowers May. In open forest in the vicinity of evergreen forest; from 3,300′—4,300′. Often one of the stamens does not develop and another appears as a linear-oblanceolate petal, which is either emarginate or rounded at the apex.

56. Camellia L.

98. C. theifera Griff.
In the plantations from 2,000′—4,500′.

XVIII. DIPTEROCARPACEÆ.

57. Shorea Roxb.

99. S. Talura Roxb. Nos. 3389, 3653, 3698. Muduva *Burala-maram*; Pulaiya *Kari-maram*.

Flowers February; fruits May—June. Rather local in distribution; a few scattered trees at the foot of Mount Stuart at about 2,000′ and gregarious colonies at Attakatti, 3,100′, in the Torakadavu Valley, 3,000′, below Pundi 3,000′ and in the Mangai-ar Valley, 2,500′.

58. Hopea Roxb.

100. H. parviflora Bedd. No. 3753.

Fruits April—June. In the evergreen forests of the western end, 2,000′—3,000′, and along the Amaravati river in the east at 1,000′.

59. Vateria L.

101. V. indica L. A. C.
"In evergreen forest at about 3,300′."

XIX. ANCISTROCLADACEÆ.

60. Ancistrocladus Wall.

102. A. Heyneanus Wall. No. 3701.
Flowers February—March. In evergreen forest at Karianshola, 2,400′.

XX. MALVACEÆ.

61. Sida L.

103. S. veronicæfolia L. (*S. humilis* Willd.)
Flowers and fruits September. At the foot of the hills, 1,200′ –1,500′.

104. S. glutinosa Cav. (*S. mysorensis* W. & A.)
Flowers October. 2,500′.

105. S. acuta Burm. (*S. carpinifolia* L.)
Flowers December. At the foot of the hills.

106. S. rhomboidea Roxb. (*S. rhombifolia* L. VAR. *rhomboidea* Mast.)
Flowers and fruits October—December. 2,000′—3,000′.

107. S. cordifolia L.
Flowers and fruits December. At the foot of the hills.

62. Abutilon Gærtn.

108. A. polyandrum Schl. No. 3,514.
Flowers and fruits December. At about 2,500′.

109. A. indicum G. Don.
Flowers and fruits June. In the drier parts; 1,200′—2,000′.

110. A. hirtum G. Don. (*A. graveolens* W. & A.)
Flowers and fruits September—December, 1,200′.

111. A. crispum G. Don.
Flowers and fruits June. In the drier parts; 1,000′.

112. A. neilgherrense Munro.
Flowers May. 4,900′.

63. Urena L.

113. U. lobata L. No. 3853.
Flowers and fruits November—January. 1,000′—3,000′.

114. U. sinuata L. No. 3856.
Flowers and fruits November—January. 1,000′—3,000′.

64. Pavonia Cav.

115. P. procumbens Boiss. (*P. glechomifolia* Garcke.)
Flowers and fruits June—December. Along the foot of the hills; 1,000′—1,500′. The bracteoles occasionally number 6 or 7.

116. P. zeylanica Cav.
Flowers and fruits, at all seasons. Along the foot of the hills and rising to 2,500′.

117. P. odorata Willd.
Flowers and fruits at all seasons. In the same situations as the last.

65. Hibiscus Medik.

118. H. surattensis L. No. 3516.
Flowers October—December. In the western forests; 1,800′.

119. H. furcatus Roxb.
Flowers and fruits November—January. 2,000′—3,000′.

120. H. micranthus L.
Flowers and fruits throughout the year. Along the foot of the hills and rising to 2,500′.

121. H. Solandra L'Herit.
Flowers and fruits July—December. 2,000′—3,200′.

122. H. canescens Heyne.
Flowers and fruits throughout the year. 900′—3,000′.

123. H. platanifolius Sweet. (*H. collinus* Roxb.)
Flowers and fruits April—May. 2,500′.

124. H. lunarifolius Willd. No. 3523.
Flowers December. 1,200′.

125. H. vitifolius L.
Flowers and fruits May—December. 900′—1,500′.

126. H. angulosus Steud. (*H. anguloso* Mast. VAR. *purpureus* Thw.). No. 3276.
Flowers January. 4,000′—5,000′.

127. **H. Abelmoschus** L.
Flowers July. At Ulandi; 2,500′.

128. **H. Lampas** Cav. (*Thespesia Lampas* Dalz. & Gibs.) Tamil *Katu-parathi.*
Flowers at all seasons except the very hottest. A very common undershrub in deciduous forest, specially in the west, 1,700′—3,000′. Flowers occasionally white. I have never found the black glandular dots on the lower surface of the leaf referred to in Cooke's "Flora of the Presidency of Bombay."

129. **H. cannabinus** L.
Flowers December.

66. Bombax L.

130. **B. malabaricum** DC. Tamil *Olaga, Yeluvai.*
Flowers and fruits March-June. Scattered in the deciduous and occasionally in the evergreen forests, 1,800′—3,000′.

131. **B. insigne** Wall. No. 3643. Tamil *Kal-yeluvai.*
Flowers October—January, when leafless; fruits May. Seen by me only in the western extremity, 2,000′—2,200′.

67. Eriodendron DC.

132. **E. pentandrum** King. (*E. anfractuosum* DC.)
Occasionally planted in hill villages. Flowers and fruit December—January.

68. Cullenia Wight.

133. **C. excelsa** Wight. Tamil *Karanai.*
Fruits ripen and fall about January. A common tall tree in the dense evergreen forests between 3,000′ and 4,000′.

XXI. STERCULIACEÆ.

69. Sterculia L.

134. **S. fœtida** L. No. 3552. Tamil *Malamtenga*; Muduva *Kaludai-vitta*; Pulaiya *Kesala-maram.*

Flowers February, when leafless; new leaves appear from March—May. I have found ripe fruit in March and in June, but flowers only in February. This points to either two flowering seasons (one having escaped me) or to the ripening of the fruits being delayed sometimes for several months. Occurs throughout the hills in rocky places, 1,600′—3,500′.

135. S. urens Roxb. No. 3688. Tamil *Shen-thanaku*.

Flowers December—February; new leaves appearing about February; fruits May. In the same localities as the last.

136. S. villosa Roxb. No. 3854. Tamil *Vakkai, Anai-nar*.

Flowers January when leafless. Common in the western tract between 1,700′ and 2,500′. The fibre is used for making the ropes employed in the capture of elephants.

137. S. guttata Roxb. Pulaya *Kavalai-maram*.

Flowers September; new leaves and fruits in the hot weather. In the evergreen and adjacent deciduous forests; 2,000′—4,000′.

138. S. Balanghas L.

Fruits ripen in the hot weather. In evergreen forest; 3,000′—4,000′.

70. Heritiera Ait.

139. H. papilio Bedd. A. C.

"In evergreen forest at 4,000′."

71. Helicteres L.

140. H. Isora L.

Flowers September—January; fruits hot weather. A common shrub in deciduous forests from the plains up to about 3,000′. The flowers are of two colours bright red and a livid blue. The latter, however, would seem to be assumed when about to fade. Many flowers to all appearances quite fresh are blue, but in this case the petals are nearly always reflexed and somewhat flaccid. On the other hand, with the red flowers the petals in the early stages are stiff and spreading and many remain red even when quite dry.

72. Pterospermum Schreb.

141. P. reticulatum W. & A.
In the Varigali valley; 2,500′.

142. P. Heyneanum Wall.
In evergreen forest, 2,400′.

143. P. rubiginosum Heyne. F. S.
Up to 3,000′.

144. P. obtusifolium Wight. F. S.

73. Eriolæna DC.

145. E. Hookeriana W. & A.
Flowres May. 3,000′—4,500′.

146. E. quinquelocularis Wight. Nos. 3226, 3469. Tamil *Malamtuthi*.
Flowers during the rains; fruits cold weather.

74. Melhania Forsk.

147. M. incana Heyne.
Fruits June. In the dry, low lying tracts in the East.

75. Melochia L.

148. M. corchorifolia L.
Flowers and fruits September. 1,500′—3,000′.

76. Waltheria L.

149. W. indica L. Tamil *Shembudu*.
Flowers throughout the year. 900′—1,500′.

77. Buettneria L.

150. B. herbacea Roxb.
Flowers and fruits May—June. 2,000′—3,000′.

XXII. TILIACEÆ.

78. Grewia L.

151. G. orientalis L. (*G. columnaris* Sm.) Tamil *Sallai*.
Flowers May—July. 1,000′—3,000′.

152. G. umbellata Roxb. A. C.
In evergreen forest at about 3,000.

153. G. betulæfolia Juss. (*G. populifolia* Vahl.)
Flowers May—June and November—January; fruits September. 900′—1,200′.

154. G. rotundifolia Juss. (*G. orbiculata* Vahl.) Tamil *Kuppamanithalai*.
Flowers and fruits June—July and December. 1,000′—3,000′.

155. G. flavescens Juss. (*G. pilosa* Lam.) Tamil *Udupai-kodi*.
Flowers July-August; fruits December to May. 900′—1,500′.

156. G. tiliæfolia Vahl. Tamil *Tadasal, Sadachi*.
Flowers March—June, new leaves April—May; fruits during the rains. Throughout the hills in deciduous forest. 1,000′—4,000′. Attaining a large size in the moist western region.

157. G. villosa Willd. A. C.
At about 3,000′.

158. G. disperma Rottl. (*G. laevigata* Vahl.) Tamil *Konapudukuchedi*.
Flowers September—October; fruits February. 1,200′—3,000′.

159. G. obtusa Wall. A. C.
At about 3,000′.

160. G. aspera Roxb. (*G. abutifolia* Juss.)
Flowers January to July. In the west; 1,200′—3,500′.

161. G. rhamnifolia Heyne. (*G. orientalis* W. & A.) A. C.
At about 3,000′.

162. G. hirsuta Vahl.

Flowers July-August; fruits December—January. A common undershrub in deciduous forest; 1,000′—3,500′.

79. Triumfetta L.

163. T. pilosa Roth.

Flowers October—January; fruits December—March. In the moister western half. 2,000′—3,000′.

164. T. rhomboidea Jacq.

Flowers and fruits December—January. A common undershrub. 1,000′—3,000′.

80. Corchorus L.

165. C. trilocularis L.

Flowers and fruits July. 900′—1,500′.

166. C. urticæfolius W. & A.

Flowers and fruits November—December. 900′—1,500′.

167. C. olitorius L.

Flowers December. 1,200′.

168. C. tridens L.

Flowers and fruits cold weather, 900′—1,200′.

169. C. acutangulus L.

Flowers and fruits September—December. 900′—1,200′.

81. Elæocarpus L.

170. E. serratus L. A. C.

In evergreen forest at 4,000′.

171. E. robustus Roxb. A. C.

In evergreen forest at about 4,000′.

172. E. oblongus Gaertn. A. C.

In evergreen forest. 3,500′—4,000′.

173. E. Munroii Mast. A. C.
At about 3,000′.

174. E. amoenus Thw. A. C.
In evergreen forest at about 4,000′.

175. E. tuberculatus Roxb. Kadir *Pahambu-maram.*
Flowers April. In evergreen forest; 3,000′—4,000′.

176. E. rugosus Roxb. A. C.
In evergreen forest at about 4,000′.

177. E. Monocera Cav. A. C.
In evergreen forest at about 3,000′.

178. E. ferrugineus Wight. No. 3560.
Flowers March; fruits April. In evergreen forest above 6,000′.

XXIII. LINACEÆ.

82. Linum L.

179. L. mysorense Heyne. No. 3217.
Flowers December—January. 3,500′—4,500′.

83. Erythroxylon L.

180. E. monogynum Roxb. Tamil *Sembulichan.*
Flowers May—June; fruits during the rains. In the drier eastern portion. 900′—2,000′.

XXIV. MALPIGHIACEÆ.

84. Hiptage Gaertn.

181. H. Madablota Gaertn.
Flowers September; fruits September to March. On rocky slopes and near streams, 1,500′—3,000′.

XXV. ZYGOPHYLLACEÆ.

85. Tribulus L.

182. T. terrestris L.

Flowers and fruits at all seasons. 900′—1,200′.

XXVI. GERANIACEÆ.

86. Geranium L.

183. G. nepalense Sweet.

Flowers May. Seen only at Periakulam swamp in the eastern half. 6,150′.

87. Oxalis L.

184. O. corniculata L.

Flowers and fruits throughout the year. A widespread plant found at all elevations. It is spreading in the planting district where it is likely to prove a troublesome weed.

88. Biophytum DC.

185. B. sensitivum DC.

Flowers and fruits seen in May, September, October and December. Probably it flowers and fruits at all seasons except the hottest 2 months. 1,800′—3,500′. Occasionally pure white and very pale yellow flowers are met with.

186. B. Reinwardtii Walp. A. C.

At about 3,000′.

89. Impatiens L.

187. I. modesta Wight. F. P. M.

At 6,000′.

188. I. crenata Bedd. F. P. M.

5,000′—8,000′.

189. I. chinensis L.

Flowers and fruits August to December. In the moister deciduous forests. 1,900′—2,800′.

190. I. Kleinii W. & A.

Flowers and fruits August—October. In the same localities as the last but not reaching quite so high.

191. I. ligulata Bedd. F. P. M.

1,500′—2,500′.

192. I. pusilla Heyne (*I. inconspicua* Benth.)

Flowers and fruits March to April, August and December. In open grass land, 3,000′—7,500′.

193. I. herbicola Hook. f. No. 3283.

Flowers and fruits January. In open grass land on Ibex Hill at about 4,500′. This elegant little species was named from specimens found in a similar situation and at a similar elevation in Travancore by Herr A. Meebold in 1910.

194. I. oppositifolia L. No. 3335.

Flowers and fruits April. On the margins of swamps and streams above 6,000′.

195. I. tomentosa Heyne.

Flowers and fruits April—May. Near water; 4,000′ and above.

196. I. latifolia L. No. 3351.

Flowers and fruits April—May. 4,000′—6,200′.

197. I. Leschenaultii Wall.

Flowers April. 6,500′ and above.

198. I. lucida Heyne. No. 3250.

Flowers and fruits seen in December, January, August and September. 1,200′—4,200′.

199. I. verticellata Wight. No. 3209.

Flowers and fruits December to May. 2,800′—4,200′.

200. I. Balsamina L.

Flowers and fruits throughout the year. Throughout the tract in suitable situations; 1,200′—2,500′.

The varieties *longifolia* and *racemifera* ("Epitome of the British Indian species of *Impatiens*," Records of the Botanical Survey of India, Vol. iv., No. 3) occur.

201. I. Jerdoniæ Wight.

On tree trunks and on rocks. 4,000′—8,000′.

202. I. parasitica Bedd. (*I. Jerdoniæ* Wight VAR. *parasitica* Hook. f.)

In the same localities as the last.

(These last two species are common in evergreen forest, they were not in flower or fruit when seen by me in March, April and May.)

203. I. campanulata Wight. No. 3472.

Followers August. 4,300′.

204. I. Gonghii Wight. F. P. M.

205. I. viscosa Bedd. F. P. M.

206. I. omissa Hook. f. F. P. M.

207. I. parvifolia Bedd. F. P. M.

On the top of Akka-malai at 8,000′—8,200′ (Beddome).

208. I. cordata Wight. F. P. M.

At 3000′ to 5000′.

209. I. elegans Bedd. No. 3252.

Flowers and fruits found in January, April, May and August. 4,000′—6,500′.

210. I. maculata Wight. No. 3243.

Flowers and fruits January to April and in August. 3,600′—4,500′.

211. I. Tangachee Bedd. No. 3321.

Flowers and fruits April to May. In stream beds and along their banks above 4,000′. The specific name was given to this plant by Beddome after a conspicuous peak of these hills on the slopes of which he first found it. Two adjoining peaks are known as *Akka-malai* and *Tangachi-malai*, which are Tamil words signifying big and little sister, respectively; *malai*= mountain.

212. **I. Wightiana** Bedd. No. 3251.
Flowers and fruits January to May. In moist forests. 3,800′—4,500′.

XXVII. RUTACEÆ.

90. Evodia Forst.

213. **E. lunur-ankenda** Merr. (*E. Roxburghiana* Benth.)
In evergreen forest at about 6,000′.

91. Zanthoxylum L.

214. **Z. ovalifolium** Wight. Nos. 3393, 3597, 3815.
Flowers and fruits in May and December. 2,600′—4,100′.

215. **Z. tetraspermum** W. & A. No. 3674.
Flowers December. 2,600′.

216. **Z. Rhetsa** DC.
2,000′—2,500′.

92. Toddalia Juss.

217. **T. asiatica** Lam. (*T. aculeata* Pers.)
Flowers January; fruits hot weather. 1,000′—7,000′. Varying greatly in size and shape of leaves and fruit with the elevation and the moisture.

93. Vepris Comm.

218. **V. bilocularis** Engl. (*Toddalia bilocularis* W. & A.) F. P. M.
Up to 4,000′.

94. Achronychia Forst.

219. **A. laurifolia** Bl. No. 3632.
Flowers August. In evergreen forest at Karianshola; 2,400′.

220. **A. Barberi** Gamble. (*A. laurifolia* Bl. VAR. 4). F. P. M.
In evergreen forest at about 3,600′ (Barber).

95. Chloroxylon DC.

221. C. Swietenia DC. Tamil *Porasu.*
Flowers February to March; fruits hot weather. 1,000′—1,600′.

96. Glycosmis Corr.

222. G. cochinchinensis Pierre. (*G. pentaphylla* Corr.) No. 3440.
Flowers December to January and May; fruits October. A very variable common shrub, often forming dense thickets. I have seen leaves with 1, 2, 3, 4, 5, 6 or 7 leaflets. In fairly moist localities, 1,000′—1,600′.

97. Murraya L.

223. M. exotica L. No. 3397.
Flowers February to May; fruits April to June. In moist situations; 1,500′—3,000′.

224. M. Koenigii Spreng. Tamil *Karipaku.*
In the western half at about 1,200′.

98. Clausena Burm.

225. C. heptaphylla W. & A. F. P. M.
3,000′—5,000′.

226. C. indica Oliv. No. 3717.
Flowers April; fruits April to May. In and near evergreen forest; 3,500′—4,500′.

227. C. Willdenovii W. & A.
Flowers May; fruits during rains. 2,000′—4,000′.

99. Limonia L.

228. L. crenulata Roxb. (*L. acidissima* W. & A.) No. 3443. Tamil *Billuva-maram.*
Flowers May; fruits September—October. 900—1,600′.

229 L. alata W. & A. Tamil *Kat-elumichai.*
Flowers hot weather; fruits September. In dry localities; 900′—1,400′.

100. Luvunga Ham.

230. L. cleutherandra Dalz.
In evergreen forest at about 3,000′.

101. Paramignya Wight.

231. P. armata Oliv.
In evergreen forest at about 4,000′.

102. Atalantia Corr.

232. A. monophylla Corr. Tamil *Kurindai*.
Flowers January to May; fruits May to June. 900′—1,400′.

233. A. racemosa W. & A. Tamil *Kat-elumichai*.
Flowers February. At about 1,000′ in the eastern part.

234. A. ceylanica Oliv.
Flowers April. In evergreen forest; 3,000′—4,000′.

235. A. missionis Oliv. F. S.

103. Citrus L.

236. C. medica L. VAR **acida**. A. C.
In evergreen forest at about 4,000′.
(*Citrus aurantium* L. and *C. decumana* L. are cultivated.)

104. Feronia Gaertn.

237. F. Elephantum Corr. No. 3555. Tamil *Vullan-maram*.
Flowers March; fruits December. 900′—1,300′.

XXVIII. SIMARUBACEÆ.

105. Ailanthus Desf.

238. A. excelsa Roxb. No. 3678. Tamil *Pi-maram*.
Flowers January; fruits hot weather. On the plains at the foot of the hills, especially in the drier areas.

239. **A. malabarica** DC. Tamil *Mattipal-maram.*
In evergreen forest.

XXIX. OCHNACEÆ.

106. Ochna L.

240. **O. Wightiana** Wall.
On rocky slopes in the extreme eastern portion, 1,200'.

XXX. BURSERACEÆ.

107. Boswellia Roxb.

241. **B. glabra** Roxb. (*B. serrata* Roxb. VAR. *glabra*).
Seen only at Tinakadu in the eastern half; 2,200'.

108. Garuga Roxb.

242. **G. pinnata** Roxb. Tamil *Kara-vembu.*
1,200'—2,000'.

109. Commiphora Jacq.

243. **C. Berryi** Engl. (*Balsamodendron Berryi* Arn.) Tamil *Mul-kiluvai.*

Flowers October to December; fruits May to June. On the dry lower rocky slopes of the eastern part; 900'—1,200'. Much used as a live fence around fields.

244. **C. caudata** Engl. (*Protium caudatum* W. & A.) Tamil *Malam-kilvvai.*

Flowers hot weather while leafless; new leaves May to June; fruits during rains. Under heavy shade the tree often becomes more or less scandent. In dry localities in rocky places; 900'—1,500'.

245. **C. pubescens** Engl. (*Protium pubescens* W. & A.) Tamil *Malam-kiluvai.*

Fruits February. Confined to the dry eastern area in the same localities as the last species, but not so common.

110. Canarium L.

246. **C. strictum** Roxb. Tamil *Vellai-kungiliam.*

Flowers April to May. In evergreen forest; 3,000′—4,000′.

XXXI. MELIACEÆ.

111. Turræa L.

247. **T. villosa** Benn. No. 3377.

Flowers April. In evergreen forest at about 3,000′. Abundant. When fresh the petals are pure white, but soon fade to a creamy yellow.

112. Naregamia W. & A.

248. **N. alata** W. & A.

Flowers October. At Mount Stuart; 2,000′.

113. Munronia Wight.

249. **M. Wallichii** Wight. No. 3664.

Flowers hot weather; fruits December. In damp localities; 2,800′—4,000′.

114. Azadirachta A. Juss.

250. **A. indica** A. Juss. (*Melia Azadirachta* L.) Tamil *Veppam.*

Flowers April to June; fruits May to July. In the plains, not rising to any height up the slopes.

115. Melia L.

251. M. composita Willd. (*M. dubia* Hiern.) No. 3696. Tamil *Malai-vembu.*

Flowers March to April; fruits August to December. In moist localities; 1,000′—2,000′. The pulp of the fruit has a milky juice.

116. Cipadessa Bl.

252. C. baccifera Miq. (*C. fruticosa* Bl.)

Flowers hot weather; fruits cold weather. Common as under growth in deciduous forest; 1,500′—4,000′.

117. Dysoxylum B.

253. D. binectariferum Hook. f. A. C.
In evergreen forest at about 4,000′.

254 D. malabaricum Bedd. F.S. and A.C. Kadir *Porapa.*
In evergreen forest; 3,000′—4,000′.

118. Aglaia Lour.

255. A. Roxburghiana Miq. No. 3432.
Flowers May; fruits September. In evergreen forest up to about 3,000′; descending the valleys to 1,500′.

256. A. Barberi Gamble. A. C.
In evergreen forest at about 3,000′.

257. A. minutiflora Bedd. A. C.
In evergreen forest; 4,000′.

119. Amoora Roxb.

258. A. Rohituka W. & A. No. 3484.
Flowers September. In evergreen forest at about 3,000′; descending valleys to about 1,500′.

259. A. canarana Hiern. F. P. M.
In evergreen forests up to 3,500′ (Beddome).

120. Lansium Rumph.

260. L. anamallayanum Bedd. F. S.
1,500′—3,000′.

121. Walsura Roxb.

261. W. piscida Roxb. No. 3444. Tamil *Kanji-maram.*
Flowers February to May. In the drier low hills in the East; 1,000′—2,000′.

122. Heynea Roxb.

262. H. trijuga Roxb. F. P. M. and A. C.
In evergreen forest; 3,000′—6,000′.

123. Chukrassia A. Juss.

263. C. tabularis A. Juss. (*Chikrassia tabularis* A. Juss.)
On the northern slopes; 1,300′—1,600′.

124. Cedrela L.

264. C. Toona Roxb.

Fruits May. 2,000′—4,000′.
Var. **latifolia** C. DC. F. P. M.
At about 6,000′.

XXXII. DICHAPETALACEÆ (CHAILLETIACEÆ).

125. Dichapetalum Dup. Thouars.

265. D. gelonioides Engl. (*Chailletia gelonioides* Hook. f.) Nos. 3386, 3711).
Flowers April. In evergreen forest; 2,500′—4,500′.

XXXIII. OLACACEÆ.

126. Ximenia L.

266. X. americana L. Tamil *Madukarai*.
Flowers January; fruits September. Along the foot of the hills 900'—1,200'. Not very common.

127. Olax L.

267. O. Wightiana Wall. No. 3596.
Flowers May. In evergreen forest at about 4,000'.

128. Erythropalum Bl.

268. E. populifolium Mast.
Flowers January; fruits April. In evergreen forest; 3,000'—5,000'.

129. Anacolosa Bl.

269. A. densiflora Bedd. F. S.
Flowers November to December. In evergreen forest up to 2,500'.

130. Cansjera Juss.

270. C. Rheedii Gmel. Nos. 3483, 3662.
Flowers September to December; 1,200'—2,800'.

131. Opilia Roxb.

271. O. amentacea Roxb. No. 3428.
Flowers May; fruits July; 1,000'—3,000'.

132. Gomphandra Wall.

272. G. axillaris Wall. No. 3398.
Flowers April to May. In evergreen forest; 4,000'—6,500'.

273. G. coriacea Wight. (*G. polymorpha* Wight in part) F. P. M.
In sholas, 3,000′—6,000′.

274. G. polymorpha Wight. F. S. and A. C.
In evergreen forest; 3,000′—4,000′.

133. Apodytes E. Meyer.

275. A. Benthamiana Wight. No. 3568.
Flowers April to May. In evergreen forest; 6,000′—7,500′.

276. A. Beddomei Mast. A. C.
In evergreen forest up to 3,000′.

134. Mappia Jacq.

277. M. ovata Miers. F. P. M.

278. M. foetida Miers. No. 3464. Tamil *Skembakarali.*
Flowers August; fruits December to April. In deciduous and evergreen forest; 3,000′—7,000′.

135. Miquelia Meissn.

279. M. dentata Bedd. F. P. M. (Beddome).

136. Pyrenacantha Hook.

280. P. volubilis Hook.
Flowers November to January; fruits November. In the dry eastern part; 1,000′.

137. Sarcostigma W. & A.

281. S. Kleinii W. & A. A. C.
Evergreen forest at 3,300′.

XXXIV. ILICACEÆ.

138. Ilex L.

282. I. malabarica Bedd. Nos. 3328, 3559, 3795.
Flowers February to April; fruits April to May. In and near evergreen forest; 2,800′-7,500′.

283. **I. Wightiana** Wall. No. 3723.
Flowers and fruits April to May. In evergreen forest at about 6,500′.

284. **I. denticulata** Wall. F. S.
In evergreen forest from 6,000′—8,000′.

XXXV. CELASTRACEÆ.

139. Euonymus L.

285. **E. indicus** Heyne.
Flowers and fruits March to April. In evergreen forest, 4,000′—7,500′.

286. **E. dichotomus** Heyne. No. 3817.
Flowers May. In evergreen forest; 3,500′—5,000′.

287. **E. crenulatus** Wall. No. 3748. Muduva *Pulli-mara*; Pulaiya *Vattilinji*.
Flowers June. In evergreen forest up to 6,500′; descending valleys down to 2,300′.

288. **E. serratifolius** Bedd. No. 3600.
Flowers May. In evergreen forest; 4,000′.

140. Glyptopetalum Thw.

289. **G. zeylanicum** Thw. F. S.
2,000.′

141. Hicrotropis Wall.

290. **M. Wallichiana** Wight. No. 3396.
Flowers April to May. In evergreen forest; above 6,000′.

291. **M. latifolia** Wight. No. 3569.
Flowers April. In evergreen forest; 4,000′ and above.

292. **M. ramiflora** Wight. Nos. 3961, 3730.
Flowers April. In evergreen forest; above 6,000′.

142. Lophopetalum Wight.

293. **L. Wightianum** Arn. A. C.
In evergreen forest at 3,300′.

143. Kokoona Thw.

294. **K. zeylanica** Thw. F. B. I. (Beddome).

144. Celastrus L.

295. **C. paniculata** Willd. Tamil *Manja-kodi*, Malasa *Vennavaram-kodi*.
Flowers March and August; fruits September. In deciduous forest and on the edges of evergreen forest; 1,200′—4,000′.

145. Gymnosporia W. & A.

296. **G. emarginata** Roth. F. B. I.

297. **G. montana** Roxb. No. 3792. Tamil *Mulluran*.
Flowers December and February; fruits May and June. Along the foot of the hills.

146. Kurrimia Wall.

298. **K. bipartita** Laws. (*K. paniculata* Wall.) No. 3272. Tamil *Sholaikodukapuli*.
Flowers December to January; fruits April. Common in evergreen forest; 4,000′—5,500′.

147. Hippocratea L.

299. **H. obtusifolia** Roxb.
Flowers March; fruits May; 1,000′—1,200′.

300. **H. indica** Willd. No. 3618.
Flowers June. In the driest tracts at about 1,000′.

148. Elaeodendron Jacq. f.

301. E. glaucum Pers. Tamil *Siluppan, Arali.*
Flowers September to October.

149. Salacia L.

302. S. prinoides DC. Nos. 3598, 3718.
Flowers April to May. In evergreen forest; 4,000′.

XXXVI. RHAMNACEÆ.

150. Ventilago Gaertn.

303. V. madraspatana Gaertn. No. 3683. Tamil *Vembadam.*
Flowers February. 1,000′—1,500′, especially in the drier tracts.

151. Zizyphus Juss.

304. Z. Jujuba Lam. Tamil *Yellandai.*
Flowers September; fruits cold weather. In the drier parts below 1,300′.

305. Z. trinervia Roxb. (Z. *glabrata* Heyne). Tamil *Karakattan.*
Flowers June; fruits September. 900′—1,500′.

306. Z. Œnoplia Thuill. Tamil *Shingai.*
Flowers September; fruits December to January. In deciduous forests; 1,000′—2,500′.

307. Z. xylopyra Willd.
Flowers May to August; fruits September to December. In deciduous forests; 1,000′—4,000′.

308. Z. rugosa Lam. Tamil *Kottai-maram.*
In open deciduous forest; 3,000′—4,000′.

152. Scutia Comm.

309. S. indica Brogn.
Flowers January; fruits June. Only in the dry eastern part; scarcely rising above the plains.

XXXVII. VITACEÆ.

153. Vitis L.

310. V. Woodrowii Stapf.
Flowers April. At Attakatti, 3,100′.

311. V. quadrangularis Wall. Tamil *Perendai*.
Flowers May ; fruits during the rains. Below 1,500′.

312. V. repens W. & A. Nos. 3478, 3576.
Flowers May to August ; fruits August. In moist deciduous and evergreen forests ; 1,700′—3,000′.

313. V. discolor Dalz. No. 3492.
Flowers August and October ; fruits October. Near Mount Stuart ; 1,800′—2,300′. Often rooting at the nodes.

314. V. gigantea Bedd.
In the moist deciduous western forests ; 1,700′—2,000′.

315. V. Linnæi Wall.
Flowers June ; 1,000′—1,300′.

316. V. tomentosa Heyne.
Flowers September. In the moist western deciduous forests ; 1,800′.

317. V. trifolia L. (*V. carnosa* Wall.)
Flowers August. Below 1,300′.

318. V. anamallayana Bedd. F.B.I. and F.P.M.
Banks of rivers, 5,000′ (Beddome) ; up to 6,000′ (Gamble).

319. V. tenuifolia W. & A. No. 3636.
Flowers June and August. In evergreen forest in the western portion ; 2,400′.

320. V. lanceolaria Roxb.
Flowers April to May ; fruits June to July. Evergreen forest ; 3,500′—6,500′ and descending valleys to 1,000′.

321. V. pedata Vahl. A.C.
At about 4,000′.

154. Leea L.

322. L. aspera Wall. No. 3808.
Flowers May to July. In evergreen or moist deciduous forests at about 2,300′. The budding inflorescence is scarlet.

323. L. sambucina Willd.
Flowers April to July. In moist deciduous as well as evergreen forests; 2,200′—4,000′.

324. L. setuligera Clarke. No. 3494.
Flowers July and October. In the moist deciduous western forests; 1,800′—2,300′.

XXXVIII. SAPINDACEÆ.

155. Filicium Thw.

325. F. decipiens Thw. Muduva *Siru vagai*.
In evergreen forest in the Torakadavu valley; 2,600′—3,500′. (Up to 4,500′ Beddome.)

156. Cardiospermum L.

326. C. Halicacabum L.
Flowers and fruits September. Near Mount Stuart; 2,500′.

327. C. canescens Wall.
Flowers and fruits December to January; 900′—1,400′.

157. Hemigyrosa Bl.

328. H. dificiens Bedd. F.S. and A.C.
2,000′—5,000′.

329. H. canescens Thw. Tamil *Nassamathi*.
Flowers March to April; fruits May. Near streams in the dry eastern region; 1,000′-1,500′.

158. Allophylus L.

330. A. Cobbe Bl. Tamil *Perra-kodi*.

Var. racemosus.
Flowers December. On dry rocky slopes; 2,800′.

VAR. **villosus.**

Flowers July; fruits August. In moist deciduous and evergreen forests; 2,000′—3,000′.

VAR. **Rheedii.**

Flowers December. Deciduous forests; 2,500′—4,000′.

159. Schleichera Willd.

331. S. trijuga Willd. Tamil *Puvam, Puvatti.*

Flowers February to March; fruits May; new leaves appearing in December and January. Fairly common in deciduous forest; 1,500′—4,000′. Attaining a large size in the moist western region.

160. Sapindus L.

332. S. laurfiolius Vahl. (*S. trifoliatus* Hiern.) No. 3689. Tamil *Puchikottai.*

Flowers November to February; fruits April to May. In the plains and on the lower slopes up to 2,000′.

333. S. erectus Hiern. F.S. and A.C.

In evergreen forest; 2,000′—5,000′.

334. S. bifoliatus Hiern. No. 3793. Tamil *Koduvamuriki.*

On dry, rocky hill-sides, 1,300′—1,600′.

161. Nephelium L.

335. N. Longana Camb. Nos. 3705, 3706. Pulaiya *Puva-maram.*

Flowers March to April; fruits April to May. In and near evergreen forest; 2,300′—4,000′.

336. N. stipulaceum Bedd. F.S.

2,000′. Rare.

162. Harpullia Roxb.

337. H. imbricata Thw. (*H. cupanioides* Hiern.) Kadir and Malasa *Uchai.*

Fruits April. Seen only at Ulandi in evergreen forest; 2,800′.

163. Dodonaea. L.

338. D. viscosa L. Tamil *Virali.*

Flowers July to December; fruits December to February, 1,000′—7,500′.

164. Turpinia Vent.

339. T. pomifera DC. No. 3413.
Flowers April to May. In evergreen forest ; 3,000′—7,000′.

XXXIX. SABIACEAE.

165. Sabia Coleb.

340. S. malabarica Bedd. F. B. I.
Beddome ! 3,000′—4,000′.

166. Meliosma Bl.

341. M. Wightii Planch.
Flowers December. At Kadamparai ; 2,800′.

342. M. simplicifolia Roxb. No. 3262.
Flowers January to April. In evergreen forest ; 3,000′—4,000′.

343. M. Arnottiana Wight. Kadir *Manthalli-mara.*
Flowers April to May. In evergreen forest ; 3,000′—5,000′.

XL. ANACARDIACEAE.

167. Rhus L.

344. R. mysorensis Heyne. Tamil *Mullu vedathi.*
Flowers February to March. 1,000′—1,400′.

168. Mangifera L.

345. M. indica L. Tamil *Ma-maram.*
Flowers January to February ; fruits May. Along hill streams ; 1,000′—3,000′.

169. Buchanania Roxb.

346. B. Lanzan Spreng. (*B. latifolia* Roxb.) Tamil *Morai-maram, Manisheru.*
Flowers February and July ; leafless during the hot weather ; fruits June. In deciduous forest ; 1,800′—3,200′.

170. Solenocarpus W. & A.

347. S. indica W. & A.
Flowers appearing with the new leaves, April. In moist deciduous forest at about 2,500′.

171. Odina Roxb.

348. O. Wodier Roxb. No. 3427. Malasa *Anaikarai.*
Flowers May to June with the new leaves; fruits June to July. In deciduous forest throughout, but scattered.

172. Semecarpus L.

349. S. Anacardium L. f. No. 3629. Tamil *Sheru.*
Flowers August. In moist deciduous forest; 2,000′.

VAR. **cuneifolia** DC.
In the same locality as the type, but less common.

350. S. travancorica Bedd. A. C.
In evergreen forest at about 3,000′.

173. Holigarna Ham.

351. H. Arnottiana Hook. f. A. C.
In evergreen forest at 4,000′.

352. H. ferruginea March. A. C.
In evergreen forest at 3,200′.

353. H. Beddomei Hook. f. F. B. I. Beddome.

174. Nothopegia Bl.

354. N. Colebrookiana Bl. No. 3390. Muduva *Eri, Era.*
Flowers May. Torakadavu valley; 3,200′.

175. Spondias L.

355. S. mangifera Willd. Kadir *Puli-illai.*
In and near evergreen forest; 2,000′—3,000′.

356. S. acuminata Roxb. A. C.
In evergreen forest at about 3,200′.

XLI. MORINGACEAE.

176. Moringa Lam.

357. M. pterygosperma Gaertn. No. 3679. Tamil *Muringai.*
Flowers January; fruits April to May, 900′—1,500′. Commoner in the dry eastern region.

XLII. CONNARACEAE.

177. Connarus L.

358. C. macrocarpus L. A. C.
In evergreen forest at 4,000′.
359. C. Wightii Hook. f. No. 3590.
Flowers May. In evergreen forest at 4,000′.

XLIII. LEGUMINOSÆ.

178. Rothia Pers.

360. R. trifoliata Pers.
Flowers January and September; fruits February. In the drier parts below 1,200′.

179. Crotalaria L.

361. C. biflora L. No. 3201.
Flowers and fruits December. 1,000′—1,200′.

362. C. prostrata Roxb. No. 4035.
Flowers and fruits December. Mount Stuart; 2,000′.

363. C. humifusa Grah. F. B. I. Beddome. 4,000′.

364. C. acicularis Ham, No. 3518.
Flowers and fruits December. In moist deciduous forest near Mount Stuart; 2,000′.

365. C. evolvuloides Wight. No. 3852.
Flowers and fruits January to May. In open grass lands; 3,000′—7,500′. This may be, in part at least, *C. Fysoni* Dunn, Kew Bulletin 1913.

366. C. bifaria L.
Flowers September. Near Mount Stuart; 2,200′.

367. C. Wightiana Grah.
Flowers January. In open grass land; 4,500′.

368. C. ovalifolia Wall. (*C. rubiginosa* Baker).
Flowers and fruits January. In open grass land, Ibex Peak; 4,800′.

369. C. mysorensis Roth.
Flowers and fruits May and December. 2,300′—3,100′.

370. C. triquetra Dalz.
Flowers and fruits December to January. 3,000′.

371. C. albida Heyne.
Flowers May. In open grass land; 5,000′—6,000′.

372. C. nana Burm.
Flowers and fruits November to December. 3,500′.

373. C. calycina Schrank.
Flowers and fruits December to January. 2,000′—3,500′.

374. C. dubia Grah. Nos. 3510, 3916.
Flowers and fruits December to January. About 2,200′.

375. C. priestleyoides Benth. F. B. I. Beddome.

376. C. peduncularis Grah. No. 3672.
Flowers December. 2,600′.

377. C. retusa L.
Flowers and fruits October to April. 4,000′—7,000′.

378. C. lanata Bedd. F. B. I. Beddome!
3,000′—4,000′.

379. C. verrucosa L.
Flowers May. 1,500′.

380. C. semperflorens Vent.
Flowers and fruits December to January. 2,800′-4,000′.

381 C. Heyneana Grah.
Flowers September to December. In the West; 2,400′.

382. C. juncea L.
Flowers and fruits December to January. 900′—3,000′.

383. C. obtecta Grah.
Flowers December; fruits April to May. 3,000′—6,000′.

384. C. subperfoliata Wight.
Flowers January, May and December. 1,000′—4,500′.

385. C. medicaginea Lam. VAR. **luxurians.**
Flowers and fruits December. 1,000′.

386. C. Willdenoviana DC.
Flowers and fruits February, June, August and December. In the drier parts, 1,000′.

387. C. Notonii W. & A.
Flowers September. Near Mount Stuart at 2,500′.

388. C. laburnæfolia L.
Flowers and fruits February. 1,100′—1,800′.

389. C. Grahamiana W. & A.
Flowers and fruits January. 3,000′—4,500′.

180. Cyamopsis DC.

390. C. psoralioides DC.
Flowers and fruits June. In the dry eastern area; 1,000′.

181. Indigofera L.

391. I. enneaphylla L.
Flowers and fruits August to December. 1,000′.

392. I. viscosa Lam.
Flowers and fruits December. 1,200′.

393. I. pedicellata W. & A.
Flowers April to May. In open grass land above 7,000′.

394. I. uniflora Ham.
Flowers and fruits September to January. On rocky hill-sides; 1,200′—3,000′.

395. I. trifoliata L.
Flowers and fruits December. In the extreme West; 1,800′.

396. I. trita L.
Flowers and fruits December, 1,200′—3,000′.

397. I. subulata Vahl.
Flowers and fruits September to December, 1,200′—3,000′.

398. I. marginulata Grah.
Flowers and fruits September. On exposed, dry, rocky hillocks in the eastern region at about 1,300′.

399. I. parviflora Heyne.
Flowers December. At Setumadai; 1,200′.

400. I. hendecaphylla Jacq.
Flowers and fruits October. 1,000′—3,000′.

401. I. Houer Forst. (*I. argentea* Linn. VAR. *caerulea* Baker).
Flowers and fruits September. 1,200′.

402. I. tinctoria L.
Flowers September. Up to 1,300′. Presumably an escape from cultivation.

403. I. Wightii Grah.
Flowers May; fruits May to December. 1,700′—3,300′. Baker in the Flora of British India (Vol. II, page 99) gives the habitat as: "Plains of the Western Peninsula and Ceylon." I have found it far more common on the hills and not below 1,700′ in the present area. In the Attapadi valley in Malabar I found it at 4,000′.

404. I. galegoides DC. No. 3519.
Fruits December. In the moist western forests; 1,800′.

405. I. pulchella Roxb.
Flowers and fruits throughout the year with favourable rain. 3,000′—5,000′.

182. Millettia W. & A.

406. M. splendens W. & A. F. B. I.

183. Mundulea DC.

407. M. suberosa Benth.
Flowers June, fruits rains to cold weather. On the dry slopes in the eastern region; 1,400′.

184. Tephrosia Pers.

408. T. tinctoria Pers.
Flowers and fruits December. 2,000′—3,000′.

409. T. spinosa Pers. No. 3656.
Flowers and fruits November to December. In the West; 1,200′.

410. T. purpurea Pers. Tamil *Kolinji*.
Flowers and fruits May and December. 900′—1,200′.
Var. **maxima** Baker.
Flowers and fruits December. 1,200′.

411. T. villosa Pers.
Flowers and fruits June and December. 1,000′—1,300′.

185. Sesbania Pers.

412. S. aculeata Pers.
Flowers October to December. In damp situations in the moist western region. 1,200′—1,800′.

413 S. grandiflora Pers.
Cultivated near the foot of the hills.

186. Zornia Gmel.

414. Z. diphylla Pers.
Flowers and fruits September to December. 1,000′—3,000′.

187. Smithia Ait

415. S. gracilis Benth. No. 3225.
Flowers and fruits December. Above Attakatti; 3,400′.

416. S. pycnantha Benth. No. 3676.
Flowers and fruits December to January. 3,000′—4,500′.

417. S. blanda Wall. VAR. **racemosa** Baker.
Flowers October. In the western region; 3,800′.

188. Æschynomene L.

418. Æ. indica L.
Flowers and fruits May to June. In the dry eastern region; 1,000′.

189. Pycnospora R. Br.

419. P. heydisaroides R. Br. No. 3763.
Flowers and fruits September. On Vengoli ridge in the West; 5,200′.

190. Uraria Desv.

420. U. hamosa Wall.
Flowers and fruits September. Near Mount Stuart; 2,100′.

191. Alysicarpus Neck.

421. A. monilifer DC.
Flowers and fruits December. 1,000′—1,400′.

422. A. bupleurifolius DC. No. 3206.
Flowers and fruits December. 2,500′—3,200′.

423. A. rugosus DC.
Flowers and fruits December. 1,500′—2,000′.

192. Desmodium Desv.

424. D. Cephalotes Wall. No. 3493.
Flowers and fruits October to January. A very common shrub in the undergrowth of the moist deciduous forests of the western extremity; 1,700′—2,000′.

425. D. ormocarpoides DC. No. 3637.
Flowers and fruits August. In evergreen forest at Karianshola in the West; 2,400′.

426. D. pulchellum Benth. No. 3917.
Flowers September to November; sometimes on into December; fruits December and January. A common shrub in the same locality as *D. Cephalotes* Wall, but from 1,200′—3,000′.

427. D. triquetrum DC.
Flowers September to January; fruits December to April. In moist or semi-moist deciduous forest; 1,500′—3,000′.

428. D. laxiflorum DC.
Flowers May, September and December; fruits September to December. In moist deciduous forest; 1,700′—3,000′.

429. D. Scalpe DC.
Flowers and fruits December; 2,500′—3,500′.

430. D. latifolium DC.
Flowers September to January; fruits December to April. In moist deciduous forests; 1,200′—3,000′.

431. D. rufescens DC.
Flowers January to April; fruits April. 4,000′—6,500′.

432. D. polycarpum DC. var. **trichocaulon.**
Flowers and fruits December. 3,000′.
Var. ? No. 3279.
Flowers and fruits January. At Attakatti; 3,100′.

433. D. parviflorum Baker. F. B. I.
2,000′—5,000′ (Gamble).

434. D. triflorum DC.
Flowers and fruits September to December. 1,800′—3,000′.

435. **D. parvifolium** DC. No. 3237.
Flowers and fruits December. 2,800′—3,500′.

436. **D. gyrans** DC. No. 3915.
Flowers and fruits September to January. 1,800′—3,200′.

193. Abrus L.

437. **A. precatorius** L. Tamil *Kundumani*.
Flowers May and December; fruits December. In the dry tracts; 1,000′—1,700′.

194. Dumasia DC.

438. **D. villosa** DC.
Flowers December to January. 3,000′—5,000′.

195. Glycine L.

439. **G. javanica** L.
Flowers December; fruits December to January. 1,200′—3,000′.

196. Teramnus Sw.

440. **T. labialis** Spreng. VAR. **mollis.**
Fruits December; 2,500′.

197. Mucuna Adans.

441. **M. atropurpurea** DC. Tamil *Tellu-kai*.
Flowers and fruits January to February. 2,800′.

442. **M. hirsuta** W. & A.
Flowers and fruits December. 3,000′.

198. Erythrina L.

443. **E. stricta** Roxb.
Flowers February. 2,500′—3,300′.

444. E. indica Lam.
Flowers and fruits June. Probably planted only. 900′.

445. E. lithosperma Bl.
Planted as a shade tree over coffee.

199. Galactia P. Br.

446. G. tenuiflora W. & A.
Flowers August, 2500′.
VAR. **villosa.**
Flowers and fruits December. In evergreen forest; 4,000′.

200. Spatholobus Hassk.

447. S. Roxburghii Benth.
Flowers September to October; fruits December. A troublesome climber in the moist deciduous forests; 1,800′—2,500′.

201. Butea Roxb.

448. B. frondosa Roxb. No. 3702. Tamil *Porasu.*
Flowers February to March; new leaves beginning to appear in March; fruits May onwards. 1,700′—3,000′.

702. Canavalia DC.

449. C. ensiformis DC. Tamil *Tambuta-avarai.*
Flowers August to December; fruits October to December. 2,000′—3,000′.

203. Pueraria DC.

450. P. tuberosa DC. No. 3297.
Flowers March to April. 3,000′.

204. Phaseolus L.

451. P. trilobus Ait.
Flowers and fruits December. 1,200′.

452. P. aconitifolius Jacq.
Fruits February. 1,000′.

453. P. Mungo L. VAR. **Wightianus** Grah.
Flowers and fruits December, 1,200′.

454. P. calcaratus Roxb.
Flowers and fruits December. At Mount Stuart; 2,200′.

455. P. sublobatus Roxb. (P. *trinervius* Heyne.)
Flowers and fruits, August to October. 1,800′—2,200′.

205. Vigna Savi.

456. V. vexillata Benth. Cleg.

457. V. pilosa Baker. No. 3655.
Flowers November. At Mount Stuart; 2,200′.

206. Clitorea L.

458. C. Ternatea L.
Flowers and fruits May to September. 1,000′—1,200′.

207. Dolichos L.

459. D. Lablab L.
Flowers and fruits January to February. 1,000′—2,600′.

460. D. falcatus Klein.
Flowers and fruits October. 1,800′.

208. Atylosia W. & A.

461. A. crassa Prain. (*A. mollis* Benth.)
Flowers February and June. 1,200′—2,000′.

462. A. rugosa W. & A. No. 3285.
Flowers January. 4,500′.

463. A. scarabeoides Benth.
Flowers and fruits December. Mount Stuart; 2,200′.

209. Dunbaria W. & A.

464. D. ferruginea W. & A.
Flowers and fruits December. Attakatti. 3,000′.

210. Rhynchosia Lour.

465. R. rufescens DC. No. 3861.
Flowers and fruits January. Mount Stuart; 2,200′.

466. R. aurea DC.
Flowers December. 1,200′.

467. R. cana DC.
Flowers and fruits December. 3,000′.

468. R. cyanosperma Benth.
Flowers December; fruits April. 3,000′.

469. R. minima DC.
Flowers and fruits December. 1,000′.

470. R. viscosa DC.
Flowers and fruits December to January. 2,200′.

471. R. densiflora DC.
Flowers November to December; fruits December. In the western half; 1,000′—1,300′.

211. Flemingia Roxb.

472. F. strobilifera R. Br.
Flowers September to December; fruits December to April. 2,000—3,000.

473. F. Grahamiana W. & A. No. 3286.
Flowers January. On Ibex Hill; 4,600′.

474. F. semi-alata Roxb. (*F. congesta* Roxb. VAR. *semi-alata*).

Flowers January; 3,300′.

475. F. bracteata Wight. (*F. strobilifera* R. Br. VAR. *bracteata*). No. 3672.

Flowers September to December; fruits December. 3,000′.

476. F. vestita Benth. VAR **nilgheriensis.**

Flowers January. On Ibex Hill; 4,800′.

212. Dalbergia L.

477. D. latifolia Roxb. No. 3657. Tamil *Iti*; Malayalam *Biti*.

Flowers August to September (also seen in March at Attakatti); fruits November to January. Throughout the chain in deciduous forests, both dry and moist; 1,200′—4,000′. Attaining a very large size in the moist western area. The pods are frequently 5-seeded.

478. D. sissoides Grah. Tamil *Iti*.

Much less common than the last, generally in drier localities and not descending so low. It is a smaller tree. Flowers and fruits at the same season.

479. D. lanceolaria L. No. 3652.

Fruits October. Seen only in the moist western area; 1,500′—2,000′.

480. D. volubili Roxb.

Flowers March; fruits April to May. In moist deciduous forests; 1,500′—2,000′.

481. D. paniculata Roxb. No. 3421. Tamil *Pachchalan*.

Flowers May to June; fruits cold season. On the lower slopes throughout; from the foot up to 3,000′.

213. Pterocarpus L.

482. P. Marsupium Roxb. Tamil and Malayalam *Vengai*.

Flowers August to October; fruits December to January, but sometimes remaining on the trees till May. In deciduous forests, both dry and moist, throughout the hills; 1,000′—4,000′. In the moist forests it becomes an enormous tree.

214. Pongamia Vent.

483. P. glabra L. Tamil *Pungam.*

Flowers January to March; fruits September to October. Generally found near streams and ponds; 900′—1,600′.

215. Derris Lour.

484. D. scandens Benth.

Flowers November; fruits December. All along the foot of the hills, rising to 2,000′.

485. D. eualata Bedd. No. 3354.

Flowers April. In evergreen forest; 4,000′—6,500′.

216. Ormosia Jacks.

486. O. travancorica Bedd. No. 3261.

Fruits January to April. In evergreen forest; 4,000′.

217. Caesalpinia L.

487. C. Bonducella Flem.

In the dry eastern tract; 1,000′.

488. C. mimosoides Lam. Malasa *Nariporandi-mulla.*

Flowers December to January; fruits January to April. In the moist deciduous forests, forming dense thickets; 1,700′—3,000′. The crushed leaves have an odour of bugs.

218. Mezoneurum Desf.

489. M. cucullatum W. & A. Tamil *Kottimulla-kodi.*

In and near evergreen forest; 1,600′—3,000′.

219. Pterolobium R. Br.

490. P. indicum A. Rich. Tam. *Karindu, Narimorandi*; Pulaiya *Koranjuri-mulla.*

Flowers May to July; fruits August to December. Along the foot of the hills; rising to 2,500′

220. Cassia L.

491. C. Fistula L. Tamil *Konnai.*

Flowers April to May ; new leaves appear in May ; fruits cold season. Common both in dry and in moist deciduous forests and reaching a large size in the latter ; 1,000′—4,000′.

492. C. occidentalis L.

Flowers and fruits throughout the year. 900′—3,000′.

493. C. Tora L.

Flowers September ; fruits December. 1,200′—2,800′.

494. C. auriculata L. Tamil *Avarai, Avaram.*

Flowers and fruits at all seasons, but fruits chiefly in the hot weather. In the dry low-lying areas and up to 1,500′.

495. C. obovata Collad.

At the foot of the hills.

496. C. Absus L.

Flowers and fruits in the rains and cold season. Usually found in dry rocky places ; 1,000′—2,500′.

497. C. Kleinii W. & A.

Flowers and fruits during the rains. 1,700′—2,000′.

498. C. mimosoides L.

Flowers and fruits in the cold season. 1,500′—3,000′.

221. Hardwickia Roxb.

499. H. binata Roxb. No. 3486. Tamil *Acha.*

Flowers September ; fruits hot weather. In the dry hills of the eastern extremity ; 1,200′—2,000′.

222. Tamarindus L.

500. T. indica L. Tamil *Puli.*

Flowers April to June ; fruits cold season. Along the foot of the hills and rising to 4,500′ in the eastern portion. Absent from the moist and wet forests.

223. Bauhinia L.

501. B. racemosa Lam. Tamil *Athi*.

Flowers April ; fruits November ; 1,000′—2,000′.

502. B. malabarica Roxb. No. 3761. Tamil *Athi*.

Flowers rains ; fruits cold season. Confined to the moist deciduous forests of the west ; 1,800′—2,500′.

503. B. phoenicia Heyne. A. C.

In evergreen forest at Udumanparai, 3,000′.

224. Xylia Benth.

504. X. xylocarpa Taub. Tamil *Irul*.

Flowers July ; fruits April ; leafless in March, new leaves appearing in April. Confined to the moist deciduous forests of the west ; 1,500′—2,000′.

225. Entada Adans.

505. E. scandens Benth. Tamil *Anaitellu*.

Fruits December to February. Usually near streams ; 1,500′—2,500′.

226. Dichrostachys Dc.

506. D. cinerea W. & A. Tamil *Wadathalai*.

Flowers and fruits practically throughout the year. Commonest in the driest areas, where it is very gregarious ; 900′—2,000′.

227. Acrocarpus W. & A.

507. A. fraxinifolius Wight. No. 3230. Malasa *Alinji*.

Flowers December to January ; the new leaves appearing with the flowers, but many old leaves still clinging to the branches. Seen only in the Torakalavu valley at 2,500′ by me, but reported by Beddome at 4,000′.

228. Acacia Willd.

508. A. planifrons W. & A. Tamil *Koducelam, Kodaisithan*.

Flowers January. Rare within our limits but not at all uncommon in the adjoining low country to the immediate north of the eastern extremity. Below 1,100′.

509. A. arabica Willd. Tamil *Karuvelam.*

Flowers during the rains; fruits cold season. At the foot of the hills along channels and in and about tanks; occasionally found in the hills up to 2,600′.

510. A. leucophlœa Willd. Tamil *Velvelam.*

Flowers during the rains; fruits cold season. 900′—2,000′. Growing to a very large size and quite straight in the moist deciduous forests of the west.

511. A. Suma Kurz.

Flowers May to August; fruits June to September. Seldom away from water. Not common. 1,200′.

512 A. ferruginea Dc. Tamil *Parambai, Vanni.*

Flowers May and September; fruits November and May. 1,000′—1,300′. Commoner in the west.

513. A. Latronum Willd.

Flowers rains and early cold season; fruits late cold season and hot season. In the eastern region; below 1,200′.

514. A. concinna Dc. Tamil *Shigakai.*

Flowers September; fruits cold season. 2,000′—3,000′.

515. A. Intsia Willd. Tamil *Ingai, Shingai.*

Flowers rains and cold season; fruits hot season. Throughout the hills in deciduous forests; 1,000′—3,500′.

515. A. pennata Willd. No. 3686. Tamil *Ingai.*

Fruits hot weather. 1,000′—2,500′.

229. Albizzia Durazz.

517. A. Lebbek Benth. Tamil *Vaghai, Karuvaghai.*

Flowers March to April, fruits rains to cold weather and remaining on the tree till the hot weather. 1,000′—3,000′. Growing to a large size in the moist deciduous forests in the West.

518. A. odoratissima Benth. Tamil *Siruvaghai.*

Flowers April to May; fruits May to June. 2,000′—4,000′.

519. A. procera Benth. Tamil *Nirvaghai.*

Fruits March to April. Seen only near the Amaravati; 1000′.

520. A. stipulata Boiv. No. 3291.

Fruits May. In evergreen forest; 3,000′.

521. A. amara Boiv. Tamil *Usil, Unjal.*

Flowers rains to February; fruits November to hot weather. In all the deciduous forests from 900′—1,400′.

230. Pithecolobium Mart.

522. P. bigeminum Benth. No. 3575.

Flowers and fruits April to May. In evergreen forest and running down the valleys into deciduous forest at about 3,000′. Pinnae often with 4 pairs of leaflets.

523. P. subcoriaceum Thw. No. 3307.

Flowers and fruits March to April. In evergreen forest; 5,000′—6,500′.

XLIV. ROSACEAE.

231. Pygeum Gaertn.

524. P. Wightianum Bl. No. 3810.

Fruits early rains. In and near evergreen forest; 1,400′—3,000′.

525. P. ceylanicum Gaertn. F. S.

Evergreen forest at 4,000′.

232. Rubus L.

526. R. moluccanus L.

Flowers January to May; fruits April to June. In open grass lands at the edges of evergreen forest; 4,000′—7,000′.

527. R. ellipticus Smith.

Flowers January to March; fruits April to May. In the same localities as the last species.

528. R. lasiocarpus Smith.

Flowers December to March; fruits April to May. In the same localities as the last two species.

233. Fragaria L.

529. F. indica Andr.
Flowers April. In open grass land; above 6,000′.

234. Photinia Lindl.

530. P. Notoniana W. & A. F. S.
"Higher elevations."

XLV. SAXIFRAGACEÆ.

235. Vahlia Thunb.

531. V. viscosa Roxb. No. 3692.
Flowers and fruits February. Just within the area in the eastern portion at 900′.

532. V. oldenlandioides Roxb.
Flowers and fruits February and June. In the dry eastern region, close to water; 900′—1,200′. I have found the petals yellow invariably.

236. Parnassia L.

533. P. mysorensis Heyne. A. C.
"Near evergreen forest, 4,000′."

XLVI. CRASSULACEÆ.

237. Bryophyllum Salisb.

534. B. calycinum Salisb.
Flowers February; fruits May. In the dry eastern region; 1,500′.

238. Kalanchoe Adans.

535. K. floribunda W. & A. No. 3238.
Flowers December to January. Petals white. At Attakatti; 3,400′.

536. K. olivacea Dalz. No. 3667.
Flowers December. On rocks near Kadamparai; 3,000′. The upper part of the stem is often red or splashed with red.

537. K. laciniata DC. No. 3797.
Flowers February. 1,000′—2,000′.

XLVII. DROSERACEÆ.

239. Drosera L.

538. D. Burmannii Vahl.
Flowers and fruits April to May. 4,500′—6,500′.

539. D. indica L.
Flowers and fruits August to October. 1,900′—3,300′.

540. D. peltata Sm.
Flowers and fruits March to April. 7,500′.

XLVIII. HALORAGIDACEÆ.

240. Serpicula L.

541. S. indica Thw.
Flowers and fruits April to May. In Koramparai swamp; 7,500′.

XLIX. COMBRETACEÆ.

241. Terminalia L.

542. T. belerica Roxb. No. 3601. Tamil *Thani*.
Flowers April to May; new leaves April; fruits September. 1,000′—2,800′.

543. T. Chebula Retz. Tamil *Kadukai*.
Flowers March to April; fruits cold weather. 2,500′—4,500′.

544. T. Arjuna Bedd. No. 3442. Tamil *Vellamarudu.*

Flowers May; fruits cold season. Seldom away from streams; 900′-1,600′.

545. T. tomentosa Bedd. Tamil *Karamarndu.*

Flowers hot season; fruits rains; new leaves April. In deciduous forest throughout; 1,000′—4,000′. An immense tree in the moist western forests.

546. T. paniculata Roth. Tamil *Pillamarudu.*

Flowers September; fruits cold season, remaining on the tree till April. Almost confined to the moist deciduous forests in the west, where it rivals the last-named in size; 1,200′—2,500′.

242. Calycopteris Lam.

547. C. floribunda Lam. No. 3697.

Flowers February. At the foot of the hills in the west.

243. Anogeissus Wall.

548. A. latifolia Wall. No. 3482. Tamil *Vekkali, Vellanagai.*

Flowers September to October; fruits cold season; leafless March to April; new leaves April to May. In all the deciduous forests; 1,000′—4,000′. Growing very large in the moist west.

244. Combretum L.

549. C. ovalifolium Roxb. Nos. 3699, 3787.

Flowers February to March; fruits February to June. Along the foot of the hills, usually near streams; 900′—1,800′.

245. Gyrocarpus Jacq.

550. G. americanus Jacq. (*G. Jacquini* Roxb.) Tamil *Thanaku, Karamthanaku.*

Flowers February; fruits May; leafless from February on, often until well on in June in the drier localities. Very common in the Amaravati valley, where it is also much attacked by *Loranthus longiflorus* Desrouss. It seems able to cast off the attacked branches with the parasite, a large burr being left behind.

L. MYRTACEÆ.

246. Rhodomyrtus DC.

551. R. tomentosa Wight. Muduva *Karatam-pallam.*
Flowers May. Above 6,000′.

247. Eugenia L.

552. E. Munronii Wight. No. 3737. Pulaiya *Mangolu-maram.*
Flowers and fruits April to May. In dense evergreen forest; 3,300′—4,500′. (There is some doubt as to whether this is not *E. aquea* Burm., but it seems to me that it is as named.)

553. E. hemispherica Wight. No. 3311.
Flowers March to April. In evergreen forest; above 4,000′.

554. E. macrocarpa Roxb. A. C.
"In evergreen forest; about 3,000′."

555. E. laeta Ham. A. C.
"In evergreen forest; about 3,000′."

556. E. cymosa Lam. VAR. **rostrata** F. B. I. Beddome & A. C.
In evergreen forest; about 4,500′.

557. E. caryophyllæa Wight. A. C.
In evergreen forest at about 3,500′.

558. E. Arnottiana Wight.
Flowers March to April; fruits April to May. In evergreen forest; 4,000′-8000′.

559. E. Gardneri Thw. F. S.
Up to 4,000′.

560. E. revoluta Wight. No. 3729.
Flowers April. In evergreen forest; over 6,30′.

561. E. calophyllifolia Wight. Muduva *Nawa-maram*; Pulaiya *Padra-mara.*
Flowers March to April; fruits April to May. In evergreen forest; over 6,400′.

562. **E. malabarica** Bedd. F. S.

563. **E. Jambolana** Lam. Tamil *Nava-mara.*
Flowers April to May; fruits rains; 1,000′—4,000″.

564. **E. bracteata** Roxb. F. B. 1. Beddome! and A. C.
In evergreen forest; 2,000′—4,000′.

565. **E Mooniana** Wight. No. 3814.
Flowers May. Seen only on Ibex Hill; 5,000′.

248. Careya Roxb.

566. **C. arborea** Roxb.
Flowers April, when the tree is usually leafless; fruits May. Often in swampy situations; 1,000′—3,000′.

LI. MELASTOMACEÆ.

249. Osbeckia L.

567. **O. truncata** Don. No. 3236.
Flowers and fruits September to December. 1,700′—3,500′.

568. **O. zeylanica** Willd. No. 3213.
Flowers February, May, August and December; fruits May and December. 1,000′—4,000′.

569. **O. hispidissima** Wight.
Flowers April. Seen only once on the banks of the Nallaimalaiar near Mukottu Mudi in dense evergreen forest at about 3,000′.

570. **O. buxifolia** Arn. A. C.
At about 3,000′.

571. **O. aspera** Bl. VAR **minor.** A. C.
At about 4,000′.

572. **O. garcili** Bedd. F. B. 1. Beddome!
4,000′.

573. **O. Leschenaultiana** DC. No. 3323.
Flowers March to April. On grassy downs; 7,500′.

574. **O. Wightiana** Benth. A. C.
3,600′.

575. **O. octandra** DC. A. C.
3,500′.

576. **O. reticulata** Bedd. F. B. 1. Beddome!
Above 6,000′.

577. **O. Wynaadensis** C. B. Clarke.
Flowers April to May. 3,000′—4,000′.

250. Kendrickia Hook. f.

578. **K. Walkeri** Hook. f. F. B. 1. Beddome!

251. Sonerila Roxb.

579. **S. Brunonis** W. & A. No. 3273.
Flowers September and January; fruits January. 3,000′4,—500′.

580. **S. grandiflora** Wall. No. 3259, 3324.
Flowers and fruits January to April. Along stream beds and on their banks; 4,000′—7,500′.

581. **S. Wallichii** Benn. F. B. 1. Beddome!

582. **S. rotundifolia** Bedd. F. B. 1. Beddome!

252. Medinilla Gaud.

583. **M. Beddomei** C. B. Clarke. Nos. 3580, 3736.
Flowers April to May. No. 3580 in evergreen forest at about 3,000′; No. 3736 (which was in bud only and might be M. *fuchsioides* Gaud.) in evergreen forest at 7,000′.

584. **M. malabarica** Bedd. F. B. 1. Beddome.
3,000′—4,000′.

253 Memecylon L.

585. **M. amplexicaule** Roxb. A. C.
In evergreen forest at about 3,000′.

586. **M. Heyneanum** Benth. No. 3703.
Fruits April to May. 3,500′—4,500′.

587. **M. umbellatum** Burm. (M. *edule* Roxb.) Nos. 3280, 3749.
Muduva and Pulaiya *Pulluvarasi*.
Flowers January to June. 1,000′—4,000′.

LII. LYTHRACEÆ.

254. Ammannia L.

588. **A. peploides** Spreng. No. 3520.
Flowers November. 1,800′—2,000′.

589. **A. pentandra** Roxb. No. 3218*b*.
Flowers and fruits December. 2,000′—3,000′.

590. **A. baccifera** L.
Fruits September. At Mount Stuart; 2,200′.

591. **A. salicifolia** Monti. No. 3521.
Flowers September; fruits December. 1,200′.

592. **A. multiflora** Roxb. No. 3790.
Flowers and fruits February. In the dry eastern region at the margins of pools and streams; 1,100′.

593. **A. sp. nov.?** Nos. 3218, 4029.
Flowers and fruits December. Just above Attakatti, 3,300′ and at Mount Stuart; 2,200′. This species has not yet been named. It was under investigation by the late Mr. M. Ramaswamy at the time of his untimely and lamented death. It is probably *Ammannia* (*Rotala*) *Fysonii* Blat & Hallb.

255. Lagerstroemia L.

594. L. lanceolata Wall. Tamil *Venték*; Malayali *Bentek*.
Flowers April to August; fruits at end of the rains. Commonest in the moist western forests, where it attains to a very large size; 1,500′—3,500′.

595. L. Flos-Reginæ Retz. No. 3811. Kadir *Yellangi*.
Flowers April to May; fruits at end of rains and cold season. I have only found this species on the Cochin frontier in the extreme West. On the banks of streams and other wet situations at about 1,600′.

LIII. ONAGRACEÆ.

256. Jussiæa.

596. J. suffruticosa L.
Flowers and fruits May, August and October. 1,000′—3,000′.

257. Ludwigia L.

597. L. parviflora Roxb.
Flowers and fruits October to February. In damp places; 1,000′—3,000′.

LIV. SAMYDACEÆ.

258. Casearia Jacq.

598. C. graveolens Dalz. No. 3463. Malasa *Kallali-maram*.
Fruits August. 1,300′—2,700′.

599. C esculenta Roxb. No. 3385.
Flowers April to May. In evergreen forest; 4,000′.

LV. PASSIFLORACEÆ.

259. Passiflora L.

600. P. foetida L.
Flowers and fruits July to October. 1,200′-2,200′.

601. P. Leschenaultii DC.
6,300′.

260. Modecca Lam.

602. M. palmata Lam.
Mount Stuart; 2,200′.

LVI. CUCURBITACEAE.

261. Trichosanthes L.

603. T. palmata Roxb.
Flowers July to December; fruits hot season. 2,000′-3,300′.

604. T. cucumerinus L. No. 4036.
Flowers and fruits August to December. 1,200′-1800′.

605. T. lobata Roxb.
Flowers January and May. In and near evergreen forest; 4,000′.

262. Gymnopetalum Arn.

606 G. Wightii Arn.
Flowers March and August. In the moist deciduous forests and neighbouring evergreen forest; 2,600′-4,000′.

263. Momordica L.

607. M. Charantia L. No. 3491.
Flowers and fruits September to October. At Karianshola; 2,400′.

608. M. dioica Roxb.
Flowers July. At Mount Stuart; 2,200′.

264. Cucumis L.

609. C. trigonus Roxb.
Flowers and fruits June. 1,200′.

265. Citrullus Schrad.

610. C. colocynthis Schrad.
Flowers and fruits June. 1200′.

266. Coccinia W. & A.

611. C. indica W. & A. (*Cephalandra indica* Naud.)
Flowers and fruits throughout the year. 1,000′-1,300′.

267. Bryoniopsis Arn.

612. B. laciniosa Naud. (*Bryonia laciniosa* L.)
Flowers and fruits in the cold season. 1,200′-3,000′.

268. Melothria L.

613. M. maderaspatana Cogn. (*Mukia scabrella* Arn.)
Flowers and fruits in the rains and cold weather. 1,200′-3,000′.

614. M. leiosperma Cogn. (*Mukia leiosperma* Thw.)
Flowers May. 4,500′.

615. M. Baueriana Cogn. (*Zehneria Baueriana* Endl.)
Flowers December. 3,100′.

616. M. perpusilla Cogn. (*Zehneria Hookeriana* Arn.)
Flowers May to June. 2,200′-4,500′.

617. M. umbellata Cogn. (*Zehneria umbellata* Thw.) A. C. 3,000′.

618. M. zeylanica C. B. Clarke. No. 3668.
Flowers December. Kadamparai; 2,800′.

269. Corallocarpus Welw.

619. C. epigaea Hook. f.
Flowers February; fruits September. 1,000′-1,500′.

270. **Blastania** Klotsch & Peyr.

620. **B. Garcini** Cogn. (*Ctenolepis Garcini* Naud.)
Flowers cold season ; fruits February to hot season. 1000′-1600′.

LVII. BEGONIACEÆ.

271. **Begonia** L.

621. **B. fallax** A. DC. No. 3250.
Flowers and fruits January to May. In open glades in evergreen forest at about 4,000′.

622. **B. malabarica** Lam. No. 3207.
Flowers and fruits December to May. 1,500′-4,500′.

LVIII. DATISCACEÆ.

272. **Tetrameles** R. Br.

623. **T. nudiflora** R. Br. Tamil and Malayalam *Chini*. Rare ; seen only in the westernmost tract ; 1,800′-2,000′.

LIX. CACTACEÆ.

273. **Opuntia** Mill.

624. **O. Dillenii** Haw.
Flowers and fruits all the year. A very troublesome pest that has run wild and grows in dense thickets all along the foot of the hills and occurs also here and there in the hills. Up to about 3,200′.

LX. FICOIDEÆ.

274. **Trianthema** L.

625. **T. monogyna** L.
Flowers and fruits July. At the lowest elevations.

626. **T. decandra** L.
Flowers and fruits June. At the lowest elevations.

275. Mollugo L.

627. **M. hirta** Thunb.
Flowers and fruits June. 1,000′-1,300′.

628. **M. oppositifolia** L. (*M. Spergula* L.)
Flowers and fruits May to September. 1,900′-1,500′.

629. **M. pentaphylla** L. (*M. stricta* L.)
Flowers and fruits December to June. 1,000′-1,300′.

630. **M. Cerviana** Seringe.
Flowers and fruits December to January, May and July. 9,00′-1,300′.

276. Giseckia L.

631. **G. pharnaceoides** L.
Flowers and fruits May. In the dry eastern region ; 1,100′.

LXI. UMBELLIFERÆ.

277. Hydrocotyle L.

632. **H. javanica** Thunb.
Flowers and fruits throughout the year. 2,500′-3,500′.

633. **H. rotundifolia** Roxb.
Flowers April. In moist situations ; 4,000′-8,000′.

634. **H. asiatica** L.
Flowers and fruits December to January. 4,000′.

278. Bupleurum L.

635. **B. mucronatum** W. & A.
Flowers and fruits December. 3,000′-4,000′.

636. **B. distichophyllum** W. & A. A. C.
"At about 3,300′."

279. Pimpinella L.

637. P. Heyneana Wall.
Flowers and fruits December. 1,200'-6,400'.

638. P. Leschenaultiana DC. No. 3571.
Flowers April. In swampy soil in grass lands ; 1,000 .

639. P. Candolleana W. & A.
Flowers and fruits January and May. In grass lands ; 4,200'-7,000'

640. P. monoica Dalz.
Flowers and fruits December. 4,000'.

280. Peucedanum L.

641. P. anamallayanum C. B. Clarke.
Flowers May. At Periakulam, 5,300'.

281. Heracleum L.

642. H. Sprengelianum W. & A. No. 3,570'.
Flowers and fruits April. In grass lands ; 7,000'.

282. Coriandrum L.

643. C. sativum L.
Run wild. Flowers August. 3,000'.

LXII. ARALIACEAE.

283. Polyscias Forst.

644. P. acuminata Seem. No. 3734.
Fruits April, 7,000'.

284. Heptapleurum Gaertn.

645. H. rostratum Bedd. F. S.
5,000'-6,000'.

646. H. racemosum Bedd. F. S. and A. C.
3,000′-7,000′.

647. H. venulosum Seem. No. 3366. Muduva *Moduvan,*; Pulaiya *Aiveril.*
Flowers May to June. 1,700′-2,800′.

648. H. Wallichianum C.B. Clarke Nos. 3409, 3732.
Flowers April to May. In evergreen forest; 3,000′-7,000′.

LXIII. CORNACEÆ.

285. Alangium Lam.

649. A. Lamarckii Thw. Tamil *Alingi.*
Flowers December to February; fruits hot weather. 1,000′-1,300′.

286. Mastixia. Bl.

650. M. arborea C. B. Clarke. A. C.
3,000′.

LXIV. CAPRIFOLIACEÆ.

287. Viburnum.

651. V. punctatum Ham.
Flowers and fruits December. 3,000′-4,000′.

288. Lonicera. L.

652. L. ligustrina Wall. No. 3408.
Flowers May. Periakulam; 6,200′

LXV. RUBIACEÆ.

289. Adina Salisb.

653. A. cordifolia Hook. f. Tamil *Manjakadambai.*
Flowers November to December; fruits January to February. In deciduous forest; 1,000′-3,500′. Growing to a very large tree in the moist western region.

290. Mytragyne Korth.

654. M. parvifolia Korth. (*Stephegyne parvifolia* Korth.) Tamil *Nirkadambai.*

Flowers May to June ; fruits July. In the same localities as the last and replacing it near water. A very large tree at the lower elevations in the moist forests.

655. M. tubulosa Korth. (*Stephegyne tubulosa* Hook. f.) A.C. "At Udumanparai, about 3,000'."

291. Hymenodictyon Wall.

656. H. excelsum Wall. No. 3764. Tamil *Perunjoli.*

Flowers in the rains ; fruits November to December. 1,300'-3,000'.

292. Wendlandia Bartt.

657. W. Notoniana Wall.

Flowers January to March. In open deciduous forest and scattered in grass land ; 3,000'-4,500'.

293. Neurocalyx Hook.

658. N. Wightii Arn. No. 3380.

Flowers April to May. In evergreen forest ; 3,000'-3,500'.

294. Hedyotis L.

659. H. articularis Br.

Flowers April. Thanakumalai peak ; 8,200'.

660. H. stylosa Br.

Flowers and fruits March to April. In grass lands ; over 7,000'.

661. H. swertioides Hook. f. A.C.

4,000'.

662. H. buxifolia Bedd. No. 3558.

Flowers and fruits April. Thanakumalaislopes ; 8,100'.

663. H. auricularia L.

Flowers April to May, October and December ; fruits December. 1,400'-3,000'.

664. H. nitida W. & A. No. 3456.
Flowers July. Mount Stuart; 2,200′.

295. Oldenlandia L.

665. O. corymbosa L.
Flowers and fruits September and December; 1,000′-3,000′.

666. O. herbacea Roxb. (*O. Heynii* Br.)
Flowers and fruits April. 1,700′-3,000′.

667. O. umbellata L.
Flowers and fruits December to February. 1,200′-3,000′.

668. O. Wightii Hook. f.
Flowers and fruits December to May. 2,000′-3,000′.

669. O. dichotoma Koen. No. 3284.
Flowers and fruits December to February. Corolla pale blue. 2,500′—3,300′.

670. O. nudicaulis Roth. Nos. 3481, 3645.
Flowers and fruits September to December. In the moist deciduous forests in the West; 1,700′—2,000′.

296. Anotis DC.

671. A. Leschenaultiana W. & A.
Flowers December to April; fruits January to April. 3,500′—7,000′.

672. A. Rheedii W. & A. No. 3496.
Flowers and fruits September to October. In the moist western region; 3,000′—4,000′.

673. A. quadrilocularis Thw. 3495.
Flowers and fruits October. In the moist western region; 4,000′.

674. A. monosperma W. & A. No. 3296.
Flowers January, 4,000′.

297. Ophiorrhiza L.

675. O. Mungos L. No. 3256.
Flowers and fruits January, April and July. 2,000′—4,000′.

676. O. Harrisiana Heyne. A.C.
Paralai, 4,000′.

677. O. hirsutella Wight. No. 3277.
Flowers and fruits January to February and May. In evergreen forest; 3,000′—4,500′.

678. O. pectinata Arn. No. 3257.
Fruits January. In and near evergreen forest; 2,800′—4,000′.

679. O. sp.? PROX. *rosea*. No. 3381.
Flowers April. In evergreen forest; about 3,200′.

298. Mussænda L.

680. M. frondosa L.
Flowers and fruits at all seasons. 1,500′—6,400′.

299. Acranthera Arn.

681. A. anamallica Bedd. No. 3246.
Flowers and fruits January, March to April and August. In evergreen forest; 3,000′—4,500′.

300. Tarenna Gaertn.

682. T. zeylanica Gaertn. (*Webera corymbosa* Willd.) Tamil *Tarenni*.
Flowers December to May; fruits rains; 1,500′—3,000′.

301. Randia L.

683. R. uliginosa DC. Kadir *Malai-nochi*.
Fruits October to December. Confined to swampy localities in the deciduous forests in the West; 1,600′—1,900′.

684. R. dumetorum Lam. Tamil *Karai*.
Flowers April to June and November; fruits December to March. 1,000′—3,500′.

685. R. malabarica Lam.
Flowers May. 1,500′—3,000′.

686. R. Gardneri Thw.
Flowers April. In evergreen forest; about 3,000′.

687. R. rugulosa Thw.
Flowers April. In evergreen forest; about 4,000′.

302. Gardenia L.

688. G. gummifera L.
In deciduous forest; about 3,000′.

689. G. latifolia Ait. Tamil *Malan-karai.*
Flowers May to June. On rocky hill-sides; 1,700′—2,500′.

303. Diplospora DC.

690. D. apiocarpa Dalz. A. C.
In evergreen forest at 4,000′.

304. Knoxia L.

691. K. corymbosa L.
Flowers April to December; fruits December to March. 2,000′—6,500′.

692. K. Heyneana DC.
Flowers and fruits December. 2,600′.

693. K. Wightiana Wall. A. C.
At about 3,000′.

305. Plectronia L.

694. P. Wightii T. Cooke. (*Canthium umbellatum* Wight.) A. C.
In evergreen forest at about 4,000′.

695. P. didyma Gaertn. (*Canthium didymum* Roxb.) Tamil *Sulundu.*
Flowers December to January; fruits May. 1,000′—2,000′.

696. P. parviflora Bedd. (*Canthium parviflorum* Lam.) No. 3448. Tamil *Madukarai*.
Flowers May to June; fruits September to October. 1,100′—1,600′.

697. P. neilgherrense Wight. (*Canthium neilgherrense* Wight.) A. C.
In evergreen forest, 4,000′.

698. P. travancorica Bedd. (*Canthium travancorium* Bedd.) A. C.
" 3,000′."

306. Vangueria Juss.

699. V. spinosa Roxb.
In evergreen forest; up to 6,000′. Not common.

307. Ixora L.

700. I. lanceolaria Coleb.
Flowers April to May; fruits June. In evergreen forest; 4,000′—5,000′.

701. I. Notoniana Wall. No. 3348.
Flowers April. 6,500′.

702. I. parviflora Vahl.
Flowers February; fruits May. 1,000′—2,500′.

703. I. nigricans Br. No. 3248.
Flowers December to January. In evergreen forest; 2,400′—4,000′.

308. Pavetta L.

704. P. indica Lam.
Flowers April. In evergreen forest; 4,000′.
Var. **tomentosa.**
Flowers April. In moist deciduous forest; 1,700′.

705. P. hispidula W. & A.
Flowers January to March. In evergreen forest; 4,000′—4,500′.

309. Coffea L.

706. C. arabica L.

Planted, as also one or two other species yielding commercial coffee. Occasionally springing up from seed voided in the jungle by jackals, squirrels, monkeys, etc.

707. C. Wightiana W. & A.

Flowers May to June and November. Up to 1,500′.

310. Morinda L.

708. M. tinctoria Roxb. Tamil *Sayamaram.*

Flowers hot season; fruits rains and cold season. 900′—1,800′.

311. Psychotria L.

709. P. Thwaitesii Hook. f.

Flowers May. In dense evergreen forest; 3,000′—4,000′.

710. P. subintegra W. & A.

Flowers May and December. Along streams; 2,000′—3,000′.

711. P. truncata Wall. A. C.

3,500′—4,500′.

712. P. elongata Wight. Nos. 3353, 3604.

Flowers April to May. In dense evergreen forest; 4,000′—4,500′.

713. P. anamallayana Bedd. No. 3578.

Flowers May. In dense evergreen forest; 3,000′—4,000′.

312. Chasalia Comm.

714. C. curviflora Thw.

Flowers March to April. In dense evergreen forest; 4,000′—6,500′.

313. Geophila Don.

715. G. reniformis Don. No. 3622.

Flowers July; fruits December. In dense evergreen forest at Karian-shola; 2,300′.

314. Lasianthus Jack.

716. L. Blumeanus Wight. A. C.
In evergreen forest at about 4,000′.

717. L. ciliatus Wight.
Fruits January. In dense evergreen forest; 4,000′.

718. L. acuminatus Wight.
Flowers April to May; fruits May. In dense evergreen forest; 4,500′—7,000′.

315. Saprosma Bl.

719. S. indicum Dalz. No. 3809. Kadir *Pi-nari*.
Flowers May. In dense evergreen forest; at about 3,000′.

316. Spermacoce L.

720. S. stricta L. No. 3649.
Flowers and fruits October to December. 2,200′—3,500′.

721. S. hispida L.
Flowers and fruits at all seasons. 900′—2,000′.

317. Rubia L.

722. R. cordifolia L.
Flowers October to January; fruits hot season. 2,200′—4,500′.

LXVI. VALERIANACEÆ.

318. Valeriana L.

723. V. Moonii Arn. No. 3802.
Flowers April to May. In grass lands; 7,000′.

724. V. Hookeriana W. & A.
Flowers April to May. In grass lands; 6,000′—7,500′.

725. V. Leschenaultii DC. A. C.
4,000′.

726. V. Beddomei C. B. Clarke.
Flowers April to May. 6,000′—6,500′.

LXVII. DIPSACEÆ.

319. Dipsacus L.

727. D. Leschenaultii Coult.
Fruits March to April. In grass lands; 6,000′—8,000′.

LXVIII. COMPOSITÆ.

320. Erechthites Raf.

728. E. valerianaefolia DC.
Flowers and fruits May to June. Run wild in the coffee and tea estates at about 4,000′.

321. Centratherum Cass.

729. C. reticulatum Benth.
Flowers and fruits May. 4,500′.

730. C. molle Benth. Nos. 3241, 3337.
Flowers and fruits January to April. 4,500′—6,500′.

731. C. courtallense Benth. No. 3630.
Flowers August. Mount Stuart; 2,200′.

322. Vernonia Schreb.

732. V. peninsularis Clarke. No. 3326 *a*.
Flowers and fruits April. In the grass lands at the edges of patches of evergreen forest; 7,000′—7,500′.

733. V. Bourneana W. W. Smith. Nos. 3326*b*, 3327.
Flowers and fruits April. In grass lands; 7,000′—7,500′.

734. V. cinerea Less.
Flowers and Fruits July to December. 1,000′—2,500′.

735. **V. divergens** Benth.
Flowers and fruits December to January and May. 2,200′—4,500′.

736. **V. anthelmintica** Willd.
Flowers and fruits November to February. 1,200′—3,000′.

737. **V. monosis** Benth. (*V. arborea* Ham).
Flowers and fruits March to April. In and near evergreen forest; 3,000′—4,500′.

323. Elephantopus L.

738. **E. scaber** L.
Flowers September and December; fruits December. 1,200′—2,500′.

324. Adenostemma Forst.

739. **A. viscosum** Forst.
Flowers and fruits December to January. 2,600′—4,100′.

325. Ageratum L.

740. **A. conyzoides** L.
Flowers and fruits September to December. 1,000′—4,000′

326. Dicrocephala DC.

741. **D. chrysanthemifolia** DC. (including *D. latifolia* DC.)
Flowers and fruits April and December. 3,000′—7,000′.

327. Conyza Less.

742. **C. stricta** Willd.
Flowers May, August and December. 2,800′—4,500′.

328. Blumea DC.

743. **B. amplectens** DC. VAR. **arenaria** Hook. f. No. 3522.
Flowers and fruits December. In the West; 1,200′.

744. **B. Wightiana** DC.
Flowers June. In the dry eastern region; 1,200′.

745. B. lacera DC.
Flowers and fruits April to May. In evergreen forest; 4,000′.
VAR. **glandulosa.**
Flowers and fruits February. At the foot of the hills.

746. B. hieracifolia DC.
Flowers April. In grass lands; above 6,000′.

747. B. membranacea DC.
Flowers and fruits June. In the dry eastern tract; 1,200′.

748. B. oxyodonta DC.
Flowers November to December. Mount Stuart; 2,200′.

749. B. eriantha DC. No. 3855′.
Flowers January. Mount Stuart; 2,200′.

750. B. Malcolmii Hook. f.
Flowers March. In grass lands; 7,500′.

751. B. malabarica Hook. f.
Flowers and fruits April. In evergreen forest on the Travancore frontier; 6,500′.

752. B. spectabilis DC.
Flowers December to January; fruits April. In the western moist region; 1,800′—2,200′.

329. Laggera Sch.-Bip.

753. L. alata Sch.-Bip.
Flowers January; fruits April. 2,300′—7,000′.

754. . pterodonta Benth.
Fruits April. 4,000′.

330. Pluchea Cass.

755. P. tomentosa DC.
Flowers and fruits May and September. In the dry eastern region; 1,100′.

331. Sphæranthus L.

756. S. amaranthoides Burm. No. 3691.
Flowers January. In wet places; 1,000′.

757. S. indicus L.
Flowers February to June; fruits in the rains. 900′—2,000′.

332. Anaphalis DC.

758. A. Beddomei Hook.f. No. 3242.
Flowers January and April. 4,000′—7,500′.

759. A. araneosa DC.
Flowers April. In grass lands; 7,500′.

760. A. oblonga DC.
Flowers December and April. 3,500′—7,500′.

761. A. aristata DC. Nos. 3274, 3295.
Flowers December to January. 4,500′.

762. A. Meeboldii W. W. Smith. No. 3303.
Flowers March to April; fruits April to May. This little plant, discovered by Mr. Herr. A. Meebold in the Travancore hills in 1910, is abundant on the grassy ridge running from Koramparai to Thanaku peak and on the slopes of the latter peak between 7,700′ and 8,200′. This is above the general line of tree growth.

763. A. brevifolia DC. A. C.
4000′.

764. A. neelgherryana DC. A. C.
4000′.

333. Gnaphalium L.

765. G. indicum L. No. 3693.
Flowers and fruits February, April, September and December. 1,000′—6,500′.

766. G. luteo-album L. A. C.
3,000′—6,000′.

334. Flaveria Juss.

767. F. Contrayerba Pers.
Flowers and fruits throughout the year. 900′—1,300′. Quite acclimatised.

335. Vicoa Cass.

768. V. auriculata Cass.
Flowers May and December. 900′—3,000′.

336. Pulicaria Gaertn.

769. P. Wightiana Clarke.
Flowers June and December. 900′-1,200′

337. Xanthium L.

770. X. Strumarium L.
Flowers January; fruits September. In the dry eastern region; 1,000′—1,500′.

338. Siegesbeckia L.

771. S. orientalis L.
Flowers and fruits April, October and December. 1,800′—2,800′.

339. Eclipta L.

772. E. erecta L. (*E. alba* Hassk).
Flowers and fruits May to July. 1,000′—2,500′.

340. Blainvillea Cass.

773. B. rhomboidea Cass. (*B. latifolia* DC.)
Flowers July, November—December; fruits December. 1,000′—3,000′

341. Wedelia Jacq.

774. W. urticaefolia DC.
Flowers October. 4,000′.

342. Spilanthes L.

775. S. Acmella L.
Flowers and fruits December to April. 3,000′—7,000′.

343. Bidens L.

776. B. pilosa L.
Flowers and fruits December. 3,000′-4,000′.

344. Galinsoga Ruiz. & Pav.

777. G. parviflora Cav.
Flowers and fruits December. 3,000′.

345. Tridax L.

778. T. procumbens L.
Flowers and fruits throughout the year. 900′—3,000′.

346. Cosmos Cav.

779. C. caudatus H. B. K. A.C.
Run wild, 3,000′.

347. Artemisia L.

780. A. parviflora L.
Flowers December and May. 3,000′—7,000′.

348. Gynura Cass.

781. G. nitida DC.
Flowers August and October. In the moist western region; 2,000′.

349. Emilia Cass.

782. E. sonchifolia DC.
Flowers December. 1,000′-3,000′.

783. E. zeylanica Clarke. No. 3338.
Flowers April. In grass lands. 7,000′.

350. Notonia DC.

784. N. grandiflora DC. Tamil *Mosakathu-thalai.*
Flowers May and August. On dry rocky slopes; 2,000′—3,000′.

785. N. Walkeri Clarke.
Fruits April. Edges of evergreen forest; 6,400′.

351. Senecio L.

786. S. nilgheryanus DC.
Flowers and fruits April to May. 6,500′

787. S. corymbosus Wall.
Fruits April to May. 7,000′.

788. S. scandens Don.
Flowers and fruits January and April. 4,000′.

352. Cnicus L.

789. C. Wallichii DC.
In grass lands; 7,000′ and above. Not very common.

353. Dicoma Cass.

790. D. tomentosa Cass.
Flowers and fruits June and November to December. At the foot of the hills, especially in the drier tracts.

354. Crepis L.

791. C. japonica Benth.
Flowers May. Torakadavu valley; 3,000′.

792. C. acaulis Hook. f.
Flowers April to May. In open grass lands; 6,000′.

355. Lactuca L.

793. L. runcinata DC. (*L. Heyneana* DC.)
Flowers and fruits May and December. At the foot of the hills.

356. Sonchus L.

794. S. arvensis L.
Flowers and fruits January. 4,000′.

LXIX. CAMPANULACEÆ.

357. Lobelia L.

795. L. trigona Roxb.
Flowers and fruits April to May. 3,000′—7,500′.

796. L. trialata Ham. Var. **lamiifolia** C. B. Clarke. No. 3336.
Flowers and fruits March to April. 7,500′.

797. L. nicotianæfolia Heyne.
Flowers December to March. 3,000′—4,000′.
Var. **trichandra.**
Flowers and fruits May. In the eastern half; 4,500′.

358. Cephalostigma A. DC.

798. C. Schimperi Hochst.
Flowers and fruits October to February. 2,000′—3,500′.

359. Wahlenbergia Schrad.

799. W. gracilis DC.
Flowers April to May. In open grass lands; 3,500′—8,000′.

360. Sphenoclea Gaertn.

800. S. zeylanica Gaertn. No. 3501.
Flowers and fruits October. In swamps in the Tekkadi forest in the extreme west; 1,800′.

361. Campanula Linn.

801. C. Alphonsi Wall. No. 3728.
Flowers and fruits April. Under shelter of rocks on a grassy slope; 7,300′.

802. C. fulgens Wall.
Flowers May. On Ibex Hill; 5,000′.

LXX. VACCINIACEÆ.

362. Vaccinium L.

803. V. nilgherrense Wight. No. 3293. Tamil *Arali*.
Flowers February to March. 2,800′—4,000′.

804. V. Leschenaultii Wight.
Flowers March; fruit April. 4,000′—7,500′

LXXI. ERICACEÆ.

363. Gaultheria L.

805. G. fragrantissima Wall.
Flowers March to April; fruits May. 6,000′—8,000′.

364. Rhododendron L.

806. R. arboreum Sm. Muduva *Alanji*.
Flowers and fruits March to May. 6,000′—8,000′.

LXXII. PLUMBAGINACEÆ.

365. Plumbago L.

807. P. zeylanica L.
Flowers and fruits throughout the year. 1,000′—1,400′.

LXXIII. PRIMULACEÆ.

366. Lysimachia L.

808. L. Leschenaultii Duby.
Flowers and fruits April to May. 5,000′—7,800′.

809. L. deltoides Wight.
Flowers and fruits April to May. 6,000′—7,800′.

367. Centunculus L.

810. C. tenellus Duby. No. 3219.
Flowers and fruits September to December. 2,500′—4,500′.

LXXIV. MYRSINACEÆ.

368. Mæsa Forsk.

811. M. Perottetiana DC. (*M. indica* Wall.)
Flowers and fruits throughout the year. 3,000′—4,000′.

369. Myrsine L.

812. M. capitellata Wall. A.C.
In evergreen forest at about 4,000′.
Var. **lanceolata** Wall. No. 3566.
Fruits April. In evergreen forests; 6,500′.

370. Embelia Burm.

813. E. Ribes Burm.
In and about evergreen forest; 4,000′.

814. E. Tsjeriam-cottam R. & S. (*E. robusta* Roxb. in part). No. 3466.

Flowers August. In the moist deciduous forests. 1,400′—3,000′.

371. Ardisia Sw.

815. A. paniculata Roxb. A.C.

816. A. amplexicaulis Bedd. No. 3714.
Flowers April to May. In dense evergreen forest; 3,000′—6,000′.

817. A. pauciflora Heyne.
Flowers March to May. In dense evergreen forest; 3,000′—5,000′.

818. A. rhomboidea Wight. No. 3331.
Flowers and fruits April to May. In dense evergreen forest; 2,000′—6,500′. Common.

819. A. sp. nov. (Ramaswami). No. 3299.
Flowers March. In dense evergreen forest at Iyerpadi at about 4,000′. Not yet named, was referred to Kew by the late Mr. Ramaswami. Close to *A. pauciflora* Heyne but differing as follows:—Cymes umbellate, dense; corolla pink, 1—3″ diameter; leaves black dotted and punctate.

372. Antistrophe A. DC.

820. A. serratifolia Hook. f. No. 3589.
Flowers and fruits May. In dense evergreen forest; 4,000′—4,500′.

LXXV. SAPOTACEÆ.

373. Chrysophyllum L.

821. C. Roxburghii G. Don. A.C.
In evergreen forest; 5,000′.

374. Isonandra Wight.

822. I. Perottetiana Wight. No. 3727.
Flowers April. In evergreen forest; 6,500′.

823. I. lanceolata Wight. No. 3716.
Flowers and fruits April. In dense evergreen forest, 4,000′.
VAR. **anfractuosa** C. B. Clarke.

Flowers April. In dense evergreen forest; ?,000′—4,000′.

375. Palaquium Blanco.

824. **P. ellipticum** Engl. (*Dichopsis elliptica* Benth.) Tamil *Illupai*.
Flowers April to May; fruits December to January. In dense evergreen forest; 3,000′—4,000′.

376. Bassia L.

825. **B. latifolia** Roxb.
Flowers hot season. In the western half; 1,800′—2,000′. Not common.

826. **B. malabarica** Bedd. Kadir *Kat-illupai*.
Fruits May. Along streams; 1,800′—4,000′.

377. Mimusops L.

827. **M. Elengi** L. No. 3556.
Flowers April; 2,600′.

828 **M. Roxburghiana** Wight. F. S.
At the foot of the hills.

829. **M. hexandra** Roxb. No. 3436. Tamil *Kanupalai*.
Flowers March to May; new leaves February; fruits July. On dry rocky hills in the eastern portion; 1,300′—1,600′.

LXXVI. EBENACEÆ.

378. Maba Forst.

830. **M. buxifolia** Pers. Nos. 3416, 3426.
Flowers May. 4,000′.

379. Diospyros L.

831. **D. pruriens** Dalz. F. S.

832. **D. montana** Roxb. Tamil *Vakkanai.*
Flowers May; fruits August. 1,000′-3,000′.

833. **D. Embryopteris** Pers. No. 3704. Pulaiya *Karumaram.*
Flowers April. In evergreen forest; 4,000′.

834. **D. ovalifolia** Wight. No. 3717.
Flowers June. 1,100′ (Beddome in F. S. 1000′-4,000′).

835. **D. Ebenum** Roem. No. 3616. Tamil *Pallapaimaram.*
Fruits rains. Found both in the dry eastern region at 1,100′ and in evergreen forest at about 4,000′.

836. **D. assimilis** Bedd. F. S. and A. C.

837. **D. sylvatica** Roxb. A. C.

At about 4,000′.

838. **D. microphylla** Bedd. F. S.
In dense forest up to 3,000′.

839. **D. oocarpa** Thw. A. C.
At Udumanparai.

840. **D. melanoxylon** Roxb. No. 3429.
Flowers May; fruits May and November. 1,200′-1,700′.

841. **D. Gardneri** Thw. A. C.
At Udumanparai.

842. **D. insignis** Thw. F. S.
In dense forests; 2,000′-3,000′.

843. **D. nilagirica** Bedd. A. C.
At Udumanparai.

844. **D. ramiflora** Roxb.? F. S.
A species of *Diospyros* mentioned by Beddome may be this or *D. embryopteris* Pers.

845. **D. paniculata** Dalz. F. S.
? Neliampatti Ghat.

LXXVII. STYRACEAE.

380. Symplocos L.

846. S. spicata Roxb.
Flowers March to May. 4,000′-8,000′.

847. S. anamallayana Bedd. Nos. 3312, 3562.
Flowers March to April. 7,500′ (Beddome F. S. 5,000′-6,000′).

848. S. Gardneriana Wight. F. S. and A. C.
4,000′-6,000′.

849. S. rosea Bedd. F. S.
Moist woods; 2,000′-4,000′.

850 S. obtusa Wall. F. S.
"5,000′-7,000′."

851. S. pendula Wight. Nos. 3344, 3799.
Flowers April. 6,000′-7,500′. (Beddome F. S. 5,000′-6,000′).

LXXVIII. OLEACEÆ.

381. Jasminum L.

852. J. Sambac Ait.
Flowers December. 3,000′.

853. J. Rottlerianum Wall.
Flowers January to March. 4,000′.

854. J. rigidum Zenk.
Flowers February. 2,800′.

855. J. trichotomum Heyne.
Flowers May and August. 1,200′-1,600′.

856. J. flexile Vahl. Tamil *Katumallai.*
Flowers December to February; fruits February. 1,000′-2,800.

857. J. calophyllum Wall. No. 3233.
Flowers December. 2,800′.

858. J. bignoniacum Wall. (*J. humile* L. in part).
Flowers April. 7,500′.

382. Linociera Sw.

859. L. malabarica Wall. No. 3794.
Flowers and fruits February to March. 1,700′.

860. L. intermedia Wight. No. 3332.
Flowers and fruits April. 6,500′. (Beddome F. S. Torakadaon banks, 5,000′).

383. Olea L.

861. O. glandulifera Wall. No. 3707.
Flowers April. In evergreen forest on Ibex Hill; 4,800′.

862. O. dioica Roxb. No. 3551.
Flowers December to March. 2,500′-3,500′.

384. Ligustrum L.

863. L. Walkeri Done. No. 3145.
Flowers May. 4,500′.

864. L. robustum Bl.
Flowers April to May and December; fruits December. 3,000′-6,500′.

865. L. Roxburghii Clarke.
Flowers April. 4,000′-6,500′.

866. L. neilgherrense Wight.
Flowers April; fruits January. 3,500′-6,500′.

Var. **obovata** Done.
Flowers May. 6,300′.

867. L. Perottetii A. DC. F. S..

385. Myxopyrum Bl.

868. M. smilacifolium Bl. F. B. I. Beddome!

LXXIX. SALVADORACEAE.

386. Salvadora L.

869. S. persica L. Tamil *Kunni*.
Flowers and fruits February. Along the foot of the hills.

387. Azima L.

870. A. tetracantha Lam.
Flowers September; fruits cold season. In the dry eastern region; 1,100'.

LXXX. APOCYNACEAE.

388. Carissa L.

871. C. Carandas L. Tamil *Kilakai*.
Flowers May; fruits rains. 1,000'-1,600'.

872. C. spinarum A. DC. Tamil *Kilakai*.
Flowers May to June; fruits rains. In the dry eastern tract; 1,000'.

873. C. suavissima Bedd. A. C.
At Udumanparai; 3,000'.

389. Rauwolfia L.

874. R. serpentina Benth.
Flowers April; fruits August to October. In the moist deciduous forests of the West; 1,800'-2,200'.

875. R. densiflora Benth. Nos. 3310, 3573.
Flowers March to May; fruits May. In evergreen forest; 4,000'-6,500'.

390. Lochnera. Reichb.

876. L. pusilla K. Schum (*Vinca pusilla* Murr.)
Flowers December to January; fruits December to June. A weed of cultivation; 900'-1,200'.

877. L. rosea. Reichb. (*Vinca rosea* L.)
Cultivated and run wild. Flowers at all seasons.

391. Alstonia L.

878. A. scholaris Br.
Not common. In the West; 1,200′-1,600′.

879. A. venenata Br. No. 3216.
Flowers December, April and June; fruits April. 2,000′-4,000′.

392. Plumeria L.

880. P. acutifolia Poir.
Planted. Flowers at most seasons. Up to 2,600′. Does not set fruit.

393. Ervatamia Stapf.

881. E. Heyneana T. Cobbe. (*Tabernæmontana Heyneana* Wall.) No. 3361. Kadir *Kodipalai*.
Flowers April. 1,900′.

882. E. coronaria Stapf. (*Tabernæmontana coronaria* Br.) No. 3378.
Flowers April to May. Common in dense evergreen forest; 2,000′-3,000′.

394. Holarrhena Br.

883. H. antidysenterica Wall.
Flowers April and July; fruits April and September. 1,000′-2,500′.

395. Parsonsia Br.

884. P. spiralis Wall. No. 3710.
Flowers April to May; fruits rains. In evergreen forest; 1,900′-4,500′.

396. Vallaris Burm.

885. V. Heynei Spreng. No. 3613.
Flowers June. Near water in the dry eastern tract; 1,000′.

397. Wrightia Br.

886. W. tinctoria Br. Tamil *Palai*.
Flowers June to October; fruits November to February; leafless February to March. 900′-3,000′.

887. W. tomentosa R. & S. No. 3359. Kadir *Palai*.
Flowers April. Moist forests; 3,000′.

398. Nerium L.

888. **N. odorum** Schrad.
Planted and run wild in the drier parts. Flowers December. 000'-1,500'.

399. Aganosma G. Don.

889. **A. cymosa** G. Don. A. C.
3,500'-4,500'.
VAR. **elegans**. No. 3424.
Flowers May. On the Travancore frontier in the eastern half; 2,300'.

400. Ichnocarpus Br.

890. **I. frutescens** Br.
Flowers April, September and December; fruits December. In dry ciduous forest and also in clearings in dense evergreen forest; 00'-4,000'.

LXXXI. ASCLEPIADACEÆ.

401. Hemidesmus Br.

891. **H. indicus** Br.
Flowers July, September and December. 2,000'—4,000'.

402. Cryptolepis Br.

892. **C. Buchanani** R. & S.
Flowers May; fruits December. 1,200'-4,000'.

403. Utleria Bedd.

893. **U. salicifolia** Bedd. No. 3394.
Flowers May. In rocky places; 3,000'-5,000'. A shrub, not a tree described in the F.B.I.; not exceeding 6' in height with a girth at ound level of 1¼'.

404. Decalepis W. & A.

894. **D. Hamiltonii** W. & A. F. B. I. & A. C.

405. Secamone Br.

895. **S. emetica** Br.
Flowers July. Up to 1,500'.

406. Calotropis Br.

896. C. gigantea Br. Tamil *Erakalli*.
Flowers and fruits throughout the year. 900′-2,500′. Much used as a green manure in wet cultivation.

407. Dæmia Br.

897. D. extensa Br.
Flowers October to January; fruits January. 900′-2,000′.

408. Cynanchum L.

898. C. alatum W. & A. No. 3282.
Flowers January. 3,000′.

899. C. Callialata Ham. No. 3666.
Flowers December. 2,800′.

409. Sarcostemma Br.

900. S. brevistigma W. & A.
Flowers May. 3,000′.

901. S. intermedium Dene.
Flowers cold season; fruits June. 900′-1,200′.

410. Gymnema Br.

902. G. sylvestris Br. No. 3760.
Flowers August and November to December. 1,000′-1,400′.

903. G. tingens W. & A. F.B.I.
Beddome! 4,000′.

411. Marsdenia Br.

904. M. volubilis T. Cooke. (*Dregea volubilis* Benth.)
Flowers November to December. 1,000′-3,000′.

412. Hoya Br.

905. H. pauciflora Wight.
Flowers August. 4,500′.

906. H. Wightii Hook. f. No. 3567.
Flowers April, 6,500′.

907. H. pendula Wight. No. 4033.
Flowers December. At the foot of Mount Stuart. 2,000′.

413. Tylophora Br.

908. T. tenuis Bl. No. 3557.
Flowers April and October. 1,800′-7,500′.

909. T. rotundifolia Ham. F. B. I. Beddome!

414. Leptadenia Br.

910. L. reticulata W. & A.
Flowers January; fruits June. 900′-1,200′.

415. Ceropegia L.

911. C. pusilla Wight. F. B. I.
Wight! 7,000′-8,000′.

912. C. fimbrifera Bedd. F. B. I.
Beddome! Rocky places; 3,000′-4,000′.

913. C. juncea Roxb.
Flowers January; fruits June. 900′-1,100′.

914. C. elegans Wall. No. 3407.
Flowers May and October. 2,300′-6,300′.

915. C. tuberosa Roxb.
Flowers September. Vengoli peak; 3,400′.

916. C. intermedia Wight. F. B. I.
Beddome! 2,500′.

917. C. hirsuta W. & A.
Flowers September. 1,600′.

918. C. brevicollis Hook. f. No. 3654.
Flowers October. Karianshola; 2,400′.

919. C. ensifolia Bedd. F. B. I.
Beddome! 3,000′-3,500′.

416. Caralluma Br.

920. C. fimbriata Wall. No. 3611.
Flowers January and June. 1,000'-1,600'.

417. Boucerosia Wall.

921. B. umbellata W. & A.
Flowers May to June. 1,000 -2,000'.

LXXXII. LOGANIACEÆ.

418. Buddleia L.

922. B. asiatica Lour.
Flowers May ; fruits May to June and December. 2,000'-3,000 .

419. Fagræa Thunb.

923. F. obovata Wall.
Flowers March to April ; fruits October. In evergreen forest ; 3,000'-4,000'.

420. Strychnos L.

924. S. colubrina L. A. C.
At Udumanparai.

925. S. Rheedii C. B. Clarke. No. 3579.
Flowers May. In dense evergreen forest ; 3,000'-4,000'.

926. S. Nux-vomica L. Tamil *Ettimaram*.
Flowers April ; fruits May to September. 900'-1,600'.

927. S. potatorum L. f. Tamil *Tetamaram*.
Flowers and fruits May to June. 900'-2,500'.

421. Gardneria Wall.

928. G. ovata Wall.
Flowers April. In evergreen forest. 6,500.'

LXXXIII. GENTIANACEÆ.

422. Exacum L.

929. E. bicolor Roxb. No. 3235.
Flowers December. 4,500′.

930. E. atropurpureum Bedd. A. C.
Var. **anamallayanum** Bedd. No. 3314.
Flowers March to May. Very common along stream banks in the open grass lands; 6,500′-8,000′. A very beautiful species when in flower.

931. E. Wightianum Arn.
Flowers January. 4,500′.

932. E. pumilum Griseb.
Flowers October. 4,500′.

933. E. Lawii Clarke. No. 3488.
Flowers September to November. 3,300′-4,000′.

934. E. pedunculatum L. (*E. petiolare* Griseb.). No. 3479.
Flowers August to December; fruits November to January. In the moist deciduous western forests; 1,800′-2,200′.

423. Hoppea Willd.

935. H. fastigata Clarke.
Flowers and fruits December. 2,000′-3,500′.

424. Canscora Lam.

936. C. diffusa Br.
Flowers October. In the moist deciduous western forests; 2,000′.

937. C. sessiliflora R. & S. No. 3784 a.
Flowers November. In the western half; 1,800′.

938. C. decussata R. & S.
Flowers September and December. 1,800′-3,000′.

939. C. perfoliata Lam. No. 3215.
Flowers October to December. 2,500′-3,800′.

940. C. Wallichii Clerke. No. 3784.
Flowers and fruits December to May. 1,500′-3,000′.

425. Gentiana L.

941. G. quadrifaria Bl. Nos. 3315, 3316.
Flowers April. 4,500′-7,500′.

942. G. pedicellata Wall. VAR. **Wightii** Kusneg.
Flowers March to April. Above 7,000′.

426. Swertia L.

943. S. affinis Clarke.
Flowers May. In open grass lands; 4,000′.

944. S. corymbosa Wight.
Flowers September and December. 3,000′-4,000′.

LXXXIV. HYDROPHYLLACEÆ.

427. Hydrolea L.

945. H. zeylanica Vahl. No. 3507.
Flowers and fruits November. Seen only in the Tekkadi forest in the West in swampy situations; 1,900′.

LXXXV. BORAGINACEÆ.

428. Cordia L.

946. C. Wallichii G. Don. (*C. obliqua* Willd. VRR. *Wallichii* C. B. Clarke.)
Fruits during the rains. 1,200′-2,000′.

947. C. fulvosa Wight. No. 3747. Tamil *Naravali*.
Flowers May to July and November to December; fruits August to September. 1,000′-2,000′.

429. Ehretia L.

948. E. lævis Roxb.
Flowers during the rains. 1,000′-1,300′.
Var. **canarensis** A. C.
Var. **indica** A. C.
Paralai.

949. E. buxifolia Roxb.
Flowers January. 1,200′-1,500′.

430. Coldenia L.

950. C. procumbens L.
Flowers and fruits June. In the dry eastern region at the lowest elevations.

431. Rhabdia Mart.

951. R. lycioides Mart.
Flowers December. Stream banks in the West; 2,000′.

432. Tournefortia L.

952. T. Heyneana Wall. A. C.
At Udumanparai.

953. T. reticosa Wight. No. 3244.
Flowers January to May; fruits March to May. In evergreen forest in glades; 3,500′-4,300′.

433. Heliotropium L.

954. H. zeylanicum Lam.
Flowers January. At the foot of the hills.

955. H. ovalifolium Forst.
Flowers and fruits June. At the foot of the hills.

956. H. paniculatum R. Br. No. 3452.
Flowers and fruits January and July to August. 2,000'-4,000'.

957. H. bracteatum DC.
Flowers December to February. 3,000'.

958. H. marifolium Retz. No. 3437.
Flowers May. 1,500'.

434. Trichodesma Br.

959. T. indicum Br.
Flowers February, June and December. At low elevations.

960. T. zeylanicum Br.
Flowers and fruits December and March. 3,000'-4,000'.

435. Cynoglossum L.

961. C. furcatum Wall.
Flowers and fruits December and March, 3,000'-4,000'.

LXXXVI. CONVOLVULACEÆ.

436. Rivea Chois.

962. R. hypocrateriformis Chois.
Flowers September to January; fruits December to January. 900'-1,800'.

437. Argyreia Lour.

963. A. speciosa Sw. A. C.

964. A. sericea Dalz. & Gibs.
Flowers January and August. 2,200'-4,000'.

965. A. cuneata Ker. No. 3465.
Flowers May and August; fruits December to January. 2,200′-4,000′.

438. Lettsomia Roxb.

966. L. aggregata Roxb.
Flowers September to December. 1,200′-2,300′.

967. L. mysorensis Clarke.
Flowers and fruits December to January. 3,000′.

968. L. elliptica Wight.
Flowers October to January. 3,000′.

439. Calonyction Chois.

969. C. speciosum Chois. (*Ipomœa bona-nox* L. Var. *grandiflora* C. B. Clarke.)
Flowers October to February. 1,200′-2,800′.

440. Ipomœa L.

970. I. coccinea L.
Flowers August to December. Run wild and quite acclimatised near Mount Stuart; 1,200′-2,500′.

971. I. hederacea Jacq.
Flowers and fruits October to December. 1,000′-3,000′.

972. I. calycina Benth.
Flowers December. 1,900′.

973. I. barlerioides Benth.
Flowers and fruits January. Ibex Hill; 4,500′.

974. I. Batatas Lam.
Cultivated by the hill tribes, especially the Muduvas.

975. I. involucrata Beauv. (*I. pileata* Roxb.). No. 3517.
Flowers December. Near Mount Stuart; 2,000′.

976. I. Wightii Chois. No. 3291.
Flowers December to January. 1,000′-3,000′.

977. I. bracteata Wight. No. 4034.
Flowers December. In the western region; 2,000′-3,000.

978. I. pes-tigridis L. No. 3504.
Flowers July to December. 1,000′-3,000′.
VAR. **hepaticifolia** C. B. Clarke.
Flowers October to December. Near Mount Stuart; 2,000′-2,500′. Corolla blue-purple with a darker eye.

979. I. eriocarpa Bl. No. 3648.
Flowers September to October. 2,400′-3,000′.

980. I. obscura Br.
Flowers January, September and December. 1,000′-3,000′.

981. I. sepiaria Koen.
Flowers May. In the dry eastern region; 1,000′.

982. I. staphylina R. & A.
Flowers February. In the dry eastern region; 1,000′.

983. I. campanulata L. No. 3281.
Flowers December and March. 3,000′.

984. I. pilosa Sw.
Flowers and fruits June. In the dry eastern region; 1,200′.

985. I. palmata Forsk.
Flowers October to February. Along the foot of the hills.

986. I. dasysperma Jacq. No. 3687.
Flowers February. In the dry eastern region; 1,000′-1,200′. Appearing truly wild.

441. Merremia Dennst.

987. M. hastata Hall. f. (*Ipomoea angustifolia* Jacq.)
Flowers and fruits July to October. 2,300′.

988. M. umbellata Hall. f. (*Ipomoea cymosa* R. & S.)
Flowers February. 2,500′.

442. Operculina Silva Manso.

989. O. Turpethum Silva Manso. (*Ipomoea Turpethum* Br.)
Flowers December. At the foot of the hills in the West.

443. Hewettia W. & A.

990. H. bicolor Wight.
Flowers and fruits September to December. 1,500′-2,500′.

444. Evolvulus L.

991. E. alsinoides L.
Flowers and fruits throughout the year. 900′-4,000′.

445. Porana Burm.

992. P. racemosa Roxb. No. 3671.
Flowers December. 3,000′.

446. Cuscuta L.

993. C. reflexa Roxb. A. C.
Iyerpadi.

LXXXVII. SOLANACEÆ.

447. Solanum L.

994. S. nigrum L.
Flowers July ; fruits January. 2,200′-4,000′.

995. S. verbascifolium L.
Flowers and fruits September to December. 1,500′-3,000′.

996. S. pubescens Willd. Tamil *Sundai*.
Flowers May and December. 1,000′-1,500′.

997. S. giganteum Jacq.
Flowers December. 3,000′-4,000′.

998. S. ferox L. Tamil *Periya sundai*.
Flowers July. 2,000′-4,000′.

999. S. torvum Swartz. A. C.
4,000′.

1000. S. indicum L.
Flowers and fruits September to December. Along the foot of the hills.

1001. S. trilobatum L.
Flowers October. Along the foot of the hills.

448. Lycopersicum Mill.

1002. L. esculentum Mill.
Flowers and fruits January to April. Run wild along the road leading to the planting district; 2,000′—3,300′.

449. Physalis L.

1003. P. minima L.
Flowers and fruits rain to cold season. 2,000′—3,000′.

1004. P. peruviana. L. Tamil *Pottipallam*.
Flowers December to April. Run wild and well established in favourable places; 3,000′—6,500′.

450. Withania Pauq.

1005. W. somnifera Dunal.
Flowers June; fruits December. In the western end; 1,200′.

451. Nicandra Adans.

1006. N. physaloides Gaertn.
Flowers and fruits December to January. Run wild near hill villages and now well established; 3,000′.

452. Datura L.

1007. D. fastuosa L.
Flowers December; fruits January. 900'—400'.

LXXXVIII. SCROPHULARIACEÆ.

453. Linaria Juss.

1008. L. ramosissima Wall. No. 3227.
Flowers and fruits December to January. Slopes below Attakatti; 2,700'.

454. Stemodia L.

1009. S. viscosa Roxb.
Flowers June and December. 1,200'—1,600'.

455. Limnophila Br.

1010. L. conferta Benth. No. 3513.
Flowers and fruits December. 2,000'.

1011. L. gratissima Bl. No. 3821.
Flowers July. In the western region; 2,200'.

1012. L. gratioloides Br. No. 3694.
Flowers February. In damp places, at the foot of the hills.

456. Moniera B. Juss.

1013. M. cuneifolia Mich. (*Herpestes Moniera* H.B.K.)
Flowers throughout the year. 1,200'—3,000'.

457. Dopatrium Ham.

1014. D. nudicaule Ham. No. 3789.
Flowers February. In the dry eastern region, 1,000'.

1015. D. junceum Ham. No. 3477.
Flowers and fruits August to September. In the moist western region; 1,800'—2,500'.

458. Torenia L.

1016. T. asiatica L.
Flowers August to October. 1,800′—4,000′.

459. Vandellia L.

1017. V. hirsuta Benth.
Flowers and fruits May. Torakadavu valley; 3,000′.

1018. V. scabra Benth.
Flowers and fruits April and November to December. 1,800′—3,000′.

1019. V. sessiliflora Benth. No. 3635.
Flowers August. 2,200′.

1020. V. pedunculata Benth. No. 3372.
Flowers and fruits April. 1,800′.

460. Ilysanthes Rafin.

1021. I. hyssopioides Benth.
Flowers and fruits May and October to January. 1,000′—4,000′.

1022. I. parviflora Benth.
Flowers and fruits June. In the dry eastern region; 1,100′.

461. Bonnaya Link and Otto.

1023. B. brachiata Link and Otto.
Flowers and fruits July, October and December. 2,000′—3,000′.

1024. B. reptans Spreng.
Flowers and fruits during the rains. 3,000′.

1025. B. veronicæfolia Spreng.
Flowers May. 1,400′.

Var. **verbenæfolia** Hook. f.
Flowers and fruits October. 1,800′.

462. Scoparia L.

1026. S. dulcis L.

Flowers and fruits throughout the year. In the moist western region; 1,200′—3,000′.

Apparently this little plant has spread from Serampore since 1845 (*Vide* the F.B.I., Vol. IV, page 289). It has extended practically throughout the Peninsula in suitable localities. I have met with it in Ganjam, Coimbatore and Malabar. It is increasing in the localities occupied in abundance. It may well become a pest.

463. Buchnera L.

1027. B. hispida Ham. No. 3669.

Flowers and fruits June and December. 3,000′.

464. Striga Lour.

1028. S. orobanchoides Benth. No. 3615.

Flowers June. In the dry eastern region; 1,100′. Parasitic on the roots of *Euphorbia antiquorum* L.

1029. S. densiflora Benth.

Flowers and fruits December. 1,200′.

1030. S. lutea Lour.

Flowers May, September and December. 3,000′—4,500′.

1031. S. euphrasioides Benth.

Flowers July and December. 100′—3,000′.

465. Sopubia Ham.

1032. S. delphinifolia G. Don.

Flowers and fruits throughout the year. 1,000′—3,200′.

1033. S. trifida Ham.

Flowers and fruits April to May and December. 3,000′—8,000′.

466. Micrargeria Benth.

1034. **M. Wightii** Benth.

Flowers and fruits January to February. In the dry eastern region; 1,000′—1,500′.

467. Pedicularis L.

1035. P. Perrottetii Benth. A.C.
Iyerpadi.

1036. P. zeylanica Benth.
In open grass lands. Above 5,000′.

LXXXIX. OROBANCHACEÆ.

468. Æginetia L.

1037. Æ. indica Roxb.
Flowers August to October; fruits September to December. In the moist, deciduous western forests; 1,800′-2,500′.

1038. Æ. pedunculata Wall.
Flowers September to November. 2,800′-4,000′.

469. Christisonia Gardn.

1039. C. tubulosa Benth. A.C.
In evergreen forest at about 3,700′.

1040. C. bicolor Gardn. No. 3731.
Flowers May. In evergreen forest; 6,500′.

XC. LENTIBULARIACEÆ.

470. Utricularia L.

1041. U. albo-coerulea Dalz. No. 3318.
Flowers April. 7,500′.

1042. U. arcuata Wight. No. 3221.
Flowers December. 3,500′.

1043. U. affinis Wight. A.C.

1044. U. caerulea L. No. 3222.
Flowers and fruits December. 3,500′.

1045. U. scandens Benj. A.C.

1046. U. Wallichiana Wight. No. 3320.
Flowers and fruits April to May and December to January. 2,000′—7,500′.

1047. U. nivea Vahl. (*U. racemosa* Wall.) No. 3319.
Flowers April. 7,500′.

Var. **filicaulis** C.B. Clarke.
Flowers August and December. 2,000′-3,000′.

1048. U. striatula Sm. (*U. orbiculata* Wall.) No. 3234.
Flowers and fruits October to January. 3,000′-4,500′.

XCI. GESNERACEÆ.

471. Æschynanthus Jacq.

1049. Æ. Perrottetii A. DC.
Flowers September; fruits March to April. 2,500′-6,500′.

472. Didymocarpus Wall.

1050. D. Rottleriana Wall.
Flowers and fruits August. 1,500′.

Var. **Wightii** C.B. Clarke.

Flowers and fruits May, June, August and December. 1,500′-3,000′.

1051. D. tomentosa Wight.
Flowers and fruits June. 2,200′-3,000′.

473. Klugia Schlecht.

1052. K. Notoniana A. DC.
Flowers April to May, August, October and December. 1,900′-4,200′.

474. Jerdonia Wight.

1053. J. indica Wight. F.B.I.

475. Isanthera Nees.

1054. I. permollis Nees. No. 3362.
Flowers April. In dense evergreen forest; 3,300′.

XCII. BIGNONIACEÆ.

476. Oroxylon Vent.

1055. O. indicum Vent. Kadir. *Valaongi.*
Tekkadi forests, in the extreme West; 2,000′.

477. Dolichandrone Seem.

1056. D. crispa Seem. Tamil *Chaklathipathirai* Pulaiya *Attukombbai.*
Flowers November to December; fruits June. 1,000′-1,300′.

478. Stereospermum Cham.

1057. S. chelonoides DC. Tamil *Pathirai* Pulaiya *Pambukaimaram.*
Flowers April to June; fruits December. 1200′-3000′.

479. Radermacheria Zoll. & Mor.

1058. R. xylocarpa K. Schum. (*Stereospermum xylocarpum* W.) Tamil *Vedangkurunai*; Pulaiya *Pambukai maram.*
Flowers April to May while leafless; new leaves towards the end of May; fruits cold season, sometimes remaining on the tree until the next blossoming. 1,200′-3,000′.

XCIII. PEDALIACEÆ.

480. Martynia L.

1059. M. diandra Glox.
Flowers and fruits throughout the year. 1,000′-3,000′.

481. Pedalium L.

1060. P. Murex L. Famil *Anaineriyi.*
Flowers June. At the foot of the hills.

482. Sesamum L.

1061. S. indicum DC.

Flowers September ; fruits January. Cultivated at the foot of the hills and run wild.

XCIV. ACANTHACEÆ.

483. Thunbergia L.

1062. T. fragrans Roxb.
Flowers May to January. 1,800'-3,000'.

484. Meyena Nees.

1063. M. Hawtayneana Nees. (*Thunbergia Hawtayneana* Wall.)
Vengoli peak ; 3,600'.

485. Tubiflora Gmel.

1064. T. acaulis O. Kuntze. (*Elytraria crenata* Vahl.)
Flowers December. In the dry eastern region ; 1,000'.

486. Staurogyne Wall.

1065. S. zeylanica O. Kuntze. (*Ebermaiera zeylanica* Nees.)
Flowers October. In the moist western region ; 2,000'.

487. Hygrophila Br.

1066. H. quadrivalvis Nees. No. 3857.
Flowers and fruits January. In the West ; 2,000'-2,200'.

488. Asteracantha Nees.

1067. A. longifolia Nees. (*Hygrophila spinosa* T. And.)
Flowers October to January. 1,000'-1,800'.

489. Dychoriste Nees.

1068. D. littoralis Nees. (*Calophanes littoralis* T. And.) No. 3607.
Flowers June. At the foot of the hills.

490. Ruellia L.

1069. R. patula Jacq.
Flowers throughout the year. 100'-3,000'

491. Micranthus Wendl.

1070. M. oppositifolius Wendl. (*Phaylopsis parviflora* Willd.) No. 3512.
Flowers December. 2,200'.

492. Dædalacanthus T. And.

1071. D. montanus T. And.
Flowers and fruits February to March. 2,000'-3,000'.

493. Hemigraphis Nees.

1072. H. latebrosa Nees. No. 3508.
Flowers December. 2,250'.

494. Strobilanthes Bl.

1073. S. Kunthianus T. And.
Flowers April and October. 4,000'-7,500'.

1074. S. consanguinea Clarke VAR. **hypoleuca** Clarke.
Flowers December to February, 1,300'-3,000'.

1075. S. barbatus Nees. No. 3489.
Flowers September and December. 2,000'-3,500'.

1076. S. pulneyensis Clarke. No. 3269.
Flowers December to January. 3,000'-4,500'.

1077. S. adenophorus Bedd. No. 3471.
Flowers August. 4,000'—5,000'.

1078. S. decurrens Nees. F. B. I. Beddome!

1079. S. tristis T. And. No. 3264.
Flowers January to April. 4,000'.

1080. S. anceps Nees. VAR. **microstachya** Clarke. F. B. I. Beddome!

1081. S. Heyneanus Nees. No. 3490.
Flowers September to October. 2,300.'

1082. S. Andersoni Bedd. F. B. I. Beddome!
6,000′.

1083. S. luridus Wight. F. B. I. Beddome!

1084. S. asper Wight. F. B. I.

1085. S. gracilis Bedd. F. B. I. Beddome!
"5,000′—6,000′".

1086. S. amabilis Clarke.
Flowers March to April. 4,000′—5,000′.

495. Blepharis Juss.

1087. B. boerhaaviæfolia Pers.
Flowers December to January. 1,000′—1,500′.

1088. B. molluginifolia Pers. No. 3771.
Flowers and fruits November. In the West; 1,300′.

496. Barleria L.

1089. B. Prionitis L.
Flowers June, September and December; fruits September to December. 1,000′—1,500′.

1090. B. cuspidata Heyne.
Flowers December. Along the foot of the hills.

1091. B. buxifolia L.
Flowers May to June. 1,200′—2,300′.

1092. B. mysorensis Roth.
Flowers January. At the foot of the hills.

1093. B. noctiflora L. f.
Flowers May to June. In the dry eastern region; below 1,000′.

1094. B. tomentosa Roth. VAR. **glandulosa** n. v.
Flowers December. 1,000′—1,500′.

Differs from the type and from VAR. *acuminata* in the presence of glandular hairs mixed with longer glandless ones on the branchlets, petioles and in florescence, except the corollas.

1095. B. involucrata Nees. VAR. **elata** Clarke. No. 3247.
Flowers and fruits January. 4,000′.

1096. B. pilosa Wall.
Flowers September and December to January. 1,000′—1,300′.

1097. B. courtallica Nees.
Flowers January. In evergreen forest; 4,500′.

497. Crossandra Salisb.

1098. C. undulæfolia Salisb.
Flowers December to January and May to June. 1,000′—1,600′.

498. Asystasia Bl.

1099. A. coromandeliana Nees.
Flowers September and December. 1,000′—1,500′.

1100. A. chelonoides Nees. No. 3796.
Flowers and fruits March. 2,800′.
VAR. **quadrangularis** Clarke. No. 3796 a.
Flowers and fruits December. 3,000′.

1101. A. travancorica Bedd. F. B. I. & A. C.
" Beddome ! 3,000′. A. C. 4,000′."

499. Eranthemum L.

1102. E. malabaricum Clarke.
Flowers and fruits January to February. 1,200′—2,200′.

500. Andrographis Wall.

1103. A. paniculata Nees.
Flowers March and September ; fruits September. 1,000′—2,500′.

1104. A. Wightiana Arn. F. B. I. Wight!

1105. A. macrobotrys Nees. No. 3457.
Flowers July. At Mount Stuart; 2,250′.

1106. A. viscosula Nees. VAR. **explicata** Clarke. F. B. I. Beddome!

1107. A. Neesiana Wight. A. C.
"4,000′."

1108. A. echioides Nees.
Flowers September; fruits December. 1,000′—1,200′.

501. Gymnostachyum Nees.

1109. G. canescens T. And. A. C.
Udumanparai.

502. Lepidagathis Willd.

1110. L. scariosa Nees.
Flowers December. At the foot of the hills.

1111. L. hyalina Nees. No. 3511.
Flowers December to February. 1,000′—2,500′.

503. Monothecium Hochst.

1112. M. aristatum T. And. No. 3473.
Flowers and fruits August. In the West; 1,200′.

504. Justicia L.

1113. J. montana Wall.
Flowers March. In evergreen forest; 4,300′.

1114. J. Betonica L.
Flowers February and September; fruits September. In the dry eastern region; 1,000′—1,500′.

1115. J. glauca Rottl.
Flowers June and December; fruits December. 1,000′—1,500′.

1116. J. wynaadensis Wall.
Flowers January. In evergreen forest; 3,400′.

1117. J. glabra Koen. No. 3474.
Flowers and fruits June to December. In the moister parts; 1,000′—1,500′.

1118. J. micrantha Wall.
Flowers and fruits December. 2,000′—3,000′.

1119. J. diffusa Willd.
Flowers April. In open grass lands; over 6,500′.

505. Rhinacanthus Nees.

1120. R. communis Nees.
Flowers May and December to January. 1,200′—3,000′.

506. Ecbolium Kurz.

1121. E. Linneanum Kurz.
Flowers April. 2,500′—3,500′.
VAR. **dentata** C. B. Clarke.
Flowers December. At the foot of the hills.
VAR. **lativirens** C. B. Clarke.
Flowers and fruits June. 1,500′.

507. Rungia Nees.

1122. R. Wightiana Nees. No. 3293.
Flowers and fruits January. 4,000′.

1123. R. longifolia Nees. & Arn. VAR. **latifolia** Wight. No. 3265.
Flowers January. 4,000′.

1124. R. parviflora Nees. VAR. **pectinata** C. B. Clarke.
Flowers December to January. 2,000′—3,200′.

1125. R. repens Nees.
Flowers December. In the West; 1,200′.

508. Dicliptera Juss.

1126. D. cuneata Nees.
Flowers and fruits May. 2,500′.

509. Peristrophe Nees.

1127. P. bicalyculata Nees.
Flowers December. 1,200′.

1128. P. montana Nees.
Flowers August to September and December to January. 2,000′—2,500′.

XCV. VERBENACEÆ.

*510. Browallia L.

1129. B. demissa L. No. 3275.
Flowers January. An occasional escape; 4,000.

511. Lantana L.

1130. L. Camara L.
Flowers and fruits all the year round. This dangerous pest has invaded the moist western forests, where it is giving considerable trouble; 1,200′—3,000′.

1131. L. indica Roxb.
Flowers and fruits May, September and December. 2,600′—3,400′.
VAR. **albiflora**.
Flowers November. At low elevations in the drier parts.

512. Lippia L.

1132. L. nodiflora Rich.
Flowers and fruits June. At low elevations in damp places.

1133. L. geminata H. B. K.
Flowers January to February; fruits May. In the dry eastern region; 1,000′—1,500′.

*Should be under *Solanaceæ* according to the Kew. Index [Edit.]

513. Stachytarpheta Vahl.

1134. S. indica Vahl.

Flowers and fruits May and December to January. Along the foot of the hills and up to 1,500′. Usually in damp situations.

514. Priva Adans.

1135. P. leptostachya Juss.

Flowers June to July and December to January. 1,000′—3,300′.

515. Callicarpa L.

1136. C. lanata L.

Flowers March to May and December. 3,000′—4,000′.

516. Tectona L. f.

1137. T. grandis L. f. Tamil *Teku*.

Flowers usually July to August, but also seen in February; fruits December to January, but often remaining on the tree till May. The new leaves appear in March in the moister parts and as late as May in the driest ones. Reaches a huge size in the moist western forests. Occurs practically throughout in deciduous forest; 1,000′—4,000′

517. Premna L.

1138. P. coriacea Clarke. Nos. 3373, 3577.

Flowers March; fruits in the rains. Banks of streams in dense evergreen forests; about 3,000′.

1139. P. purpurascens Thw. F. S.

1140. P. tomentosa Willd. Tamil *Kolakattai-teku*.

Flowers May to June; fruits in the rains. A common tree in the deciduous forests; 1,000′—3,000′.

1141. P. latifolia Roxb. No. 3609. Tamil *Munnai*.

Flowers May to June. In the dry eastern region; 1,000′—1,500′.

Var.? No. 3752.

Flowers June. In the dry eastern tract, 1,000′. Often with completely serrate leaves.

1142. P. Wightiana Schauer.
Flowers July. At the foot of the hills.

518. Gmelina L.

1143. G. arborea L. Tamil *Kumili.*
Flowers March to June; new leaves about May; fruits June to July. 1,200′—3,500′.

1144. G. asiatica L.
Flowers May to June and December. In the East; 900′—1,400′.

519. Vitex L.

1145. V. Negundo L. Tamil *Nochi.*
Flowers January. Along the foot of the hills; rising to 1,600′.

1146. V. altissima L. f. Tamil *Mailadi.*
Flowers May. 1,000′—3,000′.
Var. **alata.** Tamil *Mailadi.*
1,000′—4,000′.

1147. V. leucoxylon L. f. Nos. 3585, 3754. Tamil *Atunochi.*
Flowers February; fruits rains. Along the Amaravathi river; 1,100′. The flowers are often pure white.

520. Clerodendron L.

1148. C. phlomoides L. f.
In the dry eastern region; 1,000′.

1149. C. serratum Spreng.
Flowers December to January and August; fruits December to January; 2,000′—4,000′.

1150. C. infortunatum Gaertn.
Flowers and fruits December to March. 1,000′—4,500′. Attaining a height of 30 feet and a diameter of 6 inches in the dense evergreen forests, where it is one of the first woody plants to spring up in abandoned clearings.

521. Symphorema Roxb.

1151. S. involucratum Roxb.
Fruits in the hot season. At the foot of the hills, in the western half principally.

XCVI. LABIATÆ.

522. Ocimum L.

1152. O. Basilicum L.
Flowers and fruits December. At the foot of the hills.

1153. O. gratissimum L.
Flowers September. 2,500′.

523. Geniosporum Wall.

1154. G. prostratum Benth.
Flowers December to February. At low elevations. Commonest in the driest areas.

524. Acrocephalus Benth.

1155. A. capitatus Benth.
Flowers October to December. 1,200′—4,000′.

525. Orthosiphon Benth.

1156. O. tomentosus Benth.
Flowers December. 1,000′.
Var. **viscosa** Hook. f.
Flowers and fruits October. 2,500′.

1157. O. stamineus Benth. No. 3455.
Flowers July to October. 2,000′—3,000′.

526. Plectranthus L'Herit.

1158. P. rivularis Wight. F. B. I. Wight ! Beddome !

1159. P. nilghiricus Benth. No. 3289.
Flowers and fruits May. Torakadavu valley; 3,500′.

1160. P. nepetæfolius Benth.
Flowers December to January. 3,000′.

1161. P. menthoides Benth.
Flowers December to January. 3,000′.

1162. P. incanus Link.
Flowers October. In evergreen forest; 4,000′.

1163. P. coleoides Benth. No. 3278.
Flowers January. 3,400′.

1164. P. fruticosus Wight.
Flowers December to January, 3,400′.

527. Coleus Lour.

1165. C. barbatus Benth.
Flowers August and December, fruits December, 3,000′—4,000′.

528. Anisochilus Wall.

1166. A. carnosus Wall. No. 3860.
Flowers and fruits December to January. 2,000′—3,500′.

1167. A. Wightii Hook. f. No. 3746.
Flowers and fruits June and December. 2,000′—3,500′.

1168. A. dysophylloides Benth.
Flowers December to January. 2,000′—3,000′.

1169. A. robustus Hook. f.
Flowers September. On Vengoli peak; 3,500′.

529. Pogostemon Desf.

1170. P. parviflorus Benth.
Flowers December and April. 2,000′—6,500′.

1171. P. Wightii Benth. F. B. I. Wight!
"In wet places."

1172. P. mollis Benth. No. 3288.
Flowers December to January. 3,500′—4,500′.

1173. P. rotundatus Benth. A. C.

1174. P. speciosus Benth. F. B. I.
"On the outskirts of woods; 7,000′—8,000′."

530. Dysophylla Bl.

1175. D. quadrifolia Benth. F. B. I. Beddome!

531. Colebrookia Sm.

1176. C. oppositifolia Sm.
Flowers December to April. 2,500′—3,500′.

532. Micromeria Benth.

1177. M. biflora Benth.
Flowers April. In open grass lands; above 6,000′.

533. Calamintha Mœnch.

1178. C. umbrosa Benth.
Flowers and fruits April. In open grass land; above 6,000′.

534. Scutellaria L.

1179. S. violacea Heyne.
Flowers and fruits December; 4,000′.
Var. **hispidior** Benth.
Flowers and fruits January to April. 4,000′—6,500′.

1180. S. rivularis Wall. F. B. I. Wight!

535. Anisomeles Br.

1181. A. ovata Br.
Flowers December. 1,200′—3,000′.

536. Leucas Br.

1182. L. urticæfolia Br.
Flowers September to December. At the foot of the hills.

1183. L. chinensis Br.
Flowers and fruits March, September and December to January. 2,000′—3,000′.

1184. L. helianthemifolia Desf.
Flowers and fruits March to April. In grass lands; 4,500′—8,200′.

1185. L. lanceæfolia Desf.
Flowers and fruits May. 6,500′.

1186. L. vestita Benth. No. 3,816.
Flowers May. On Ibex Hill; 4,800′.

1187. L. hirta Spreng.
Flowers and fruits December. 3,000′—4,000′.

1188. L. ciliata Benth.
Flowers and fruits December. 3,000′—4,000′.

1189. L. martinicensis Br.
Flowers and fruits February. In the dry eastern region; 1,200′.

1190. L. aspera Spreng.
Flowers and fruits December, 1,000′—3,000′.

1191. L. linifolia Spreng. VAR. **decipiens** Hook. f.
Flowers June. 2,500′.

537. Leonotis Br.

1192. L. nepetæfolia Br.
Flowers September to December; fruits November to December. Along the foot of the hills.

538. Gomphostemma Wall.

1193. G. strobilinum Wall.
Flowers August to October; fruits December. 1,800′—3,000′.

1194. G. eriocarpum Benth. F. B. I. Beddome!

539. Teucrium L.

1195. T. tomentosum Heyne. No. 3292.
Flowers January. 2,800′.

XCVII. PLANTAGINACEÆ.

540. Plantago L.

1196. P. major L.
Flowers and fruits April to May. In damp places; 6,000′—7,000′.

XCVIII. NYCTAGINACEAE.

541. Boerhaavia L.

1197. B. diffusa L. (*B. repens* Linn. VAR. *diffusa*).
Flowers and fruits May and December. 1,200′—2,500′.

1198. B. repanda Willd.
Flowers and fruits throughout the year. 900′—1,600′.

1199. B. verticellata Poir. No. 3449.
Flowers and fruits July. 1,200′.

542. Pisonia L.

1200. P. aculeata L. No. 3782. Tamil *Karumthovarai*.
Flowers February; fruits June to September. In the dry eastern region; below 1,400′.

XCIX. AMARANTACEÆ.

543. Celosia L.

1201. C. argentea L.
Flowers and fruits throughout the year. A weed of cultivation; 900′—3,000′.

1202. C. polygonoides Retz.
Flowers and fruits June. A weed of cultivation. At the foot of the hills.

544. Banalia Moq.

1203. B. thyrsiflora Moq. No. 3255.
Flowers January to May; fruits March to June. In evergreen forest; 4,000′.

545. Allmania Br.

1204. A. nodiflora Br. VAR. **aspera** Hook. f.
Flowers June, 2,250′.
VAR. **angustifolia** Hook. f.
Flowers and fruits September. 1,800′.
VAR. **Roxburghii** Hook. f.
Flowers and fruits December. 1,000′,

546. Digera Forsk.

1205. D. arvensis Forsk.
Flowers August to October. Along the foot of the hills.

547. Amarantus L.

1206. A. spinosus L.
Flowers May and December. 1,500′—3,000′.

1207. A. paniculatus L. Tamil *Kira*.
Cultivated by the hill-men (Muduvas and Pulaiyas); Ripe in December. 2,000′—4,000′.

1208. A. viridis L.
Flowers and fruits July and December. 2,000′—3,000′.

1209. A. polygamus L.
Flowers December. At the foot of the hills.

548. Pupalia Juss.

1210. P. atropurpurea Moq. No. 3476.
Flowers and fruits August and December. 1,200′—2,800′.

1211. P. lappacea Moq. VAR. **velutina** Hook. f.
Flowers December. At the foot of the hills.

549. Psilotrichum Bl.

1212. P. calceolatum Moq. VAR. **tomentosa** Hook. f.
Flowers May to June. In the dry eastern region; 1,000′—1,500′.

550. Nothosærua Wight.

1213. N. brachiata Wight.
Flowers February. In the dry eastern region; 1,000′.

551. Ærua Forsk.

1214. Æ. javanica Juss.
Flowers May to June and December. 1,000′—3,000′.

1215. Æ. scandens Wall.
Flowers December. At the foot of the hills.

1216. Æ. lanata Juss.
Flowers May and December. 1,000′—1,500′.

552. Achyranthes L.

1217. A. aspera L.
Flowers and fruits June and December. Along the foot of the hills.
VAR. **porphyristachya** Hook. f.
Flowers December. At the foot of the hills.

1218. A. bidentata Bl.
Flowers December. 2,500′.

553. Alternanthera Forsk.

1219. A. triandra Lam. (*A. sessilis* R. Br.).
Flowers and fruits September and December. 1,500′—2,800′.

C. CHENOPODIACEÆ.

554. Chenopodium L.

1220. C. ambrosioides L.
Flowers December. 3,000′.

555. Basella L.

1221. B. rubra L. No. 3475.
Flowers and fruits August to December. 1,000′—3,000′.

CI. POLYGONACEÆ.

556. Polygonum L.

1222. P. pelebejum Br.
Flowers May to June. In the dry eastern region; 1,000′.

1223. P. glabrum Willd.
Flowers January, April and September. Banks of streams; 1,500′—2,000′.

1224. P. stagninum Ham.
Flowers and fruits April and September. Banks of streams; about 2,000′.

1225. P. barbatum L.
Flowers July. Banks of streams; 2,000′.

1226. P. hydropiper L. A. C.
"2,500′."

1227. P. flaccidum Meissn. No. 3663.
Flowers and fruits December. Banks of streams; 2,800′.

1228. P. alatum Ham.
Flowers April. In open grass lands; above 6,000′.

1229. P. chinense L.
Flowers March and September; fruits December. 2,200′—3,200′.
VAR **ovalifolia** Meissn.
Fruits December. 3,000′.

557. Rumex L.

1230. R. nepalensis Spreng.
Fruits April. Near water in open grass lands; above 6,000′.

CII. PODOSTEMONIACÆ.

558. Podostemon Mich.

1231. P. stylosus Benth. F. B. I. Wight!

1232. P. algæformis Benth. F. B. I. and A. C.
Beddome! Thorakadavu-ar.

1233. P. olivaceus Gardn. A. C.

1234. P. selaginoides Benth. F. B. I. and A. C.
Beddome! 4,000′.

1235. P. acuminatus Wedd. A. C.
4,000′.

1236. P. Barberi Willis. A. C. Barber!

(I have had no opportunity of collecting species of this family in the Anaimalais as my visits to the special localities they affect—on rocks in the streams in the dense evergreen forests between 2,500′ and 5,000′—took place only at such seasons when these plants are dried up and unrecognisable).

CIII. ARISTOLOCHIACEÆ.

559. Bragantia Lour.

1237. B. Wallichii Br. No. 3363.

Flowers April, May and December. In dense evergreen forest; 2,600′—4,500′.

560. Aristolochia L.

1238. A. bracteata Retz.

Flowers February. At the foot of the hills.

1239. A. indica L.

Flowers December to January; fruits January to April; 1,000′—1,600′.

1240. A. Tagala Cham. (*A. Roxburghiana* Klotzsch).

2,800′.

CIV. PIPERACEÆ.

561. Piper L.

1241. P. tristachyon Cass. A. C.

Iyerpadi.

1242. P. longum L. No. 3646.

Flowers October. 2,000′.

1243. P. brachystachyum Wall. A. C.

Iyerpadi.

1244. P. nigrum L.
Fruits April, 4,500′.

1245. P. argyrophyllum Miq. A. C.
Iyerpadi.

1246. P. subpeltatum Willd. Kadir *Pi-thallai*.
Flowers August, October and December. 2,000′—4,000′.

562. Peperomia Ruiz & Pav.

1247. P. Wightiana Miq.
At about 2,600′.

1248. P. dindigulensis Miq.
Flowers August; fruits December. 2,500′—4,000′.

1249. P. portulacoides A. Dietr.
Flowers April to May. 5,000′—7,000′.

1250. P. reflexa A. Dietr.
Flowers December. 3,000′—4,000′.

CV. CHLORANTHACEÆ.

563. Chloranthus Sw.

1251. C. brachystachyus Bl.
Flowers April to May. In evergreen forest; 3,000′—4,800′.

CVI. MYRISTICACEÆ.

564. Myristica L.

1252. M. Beddomei L. (*M. laurifolia* Hook. f.)
Fruits April. In dense evergreen forest; 3,000′—4,000′.

1253. M. attenuata Wall. A. C.
Udumanparai.

CVII. LAURACEÆ.

565. Cryptocarya R. Br.

1254. C. Wightiana Thw. A. C.
Iyerpadi.

1255. C. Stocksii Meissn. No. 3565.
Flowers April to May. In evergreen forest; 3,000′—6,500′.

566. Beilschmiedia Nees.

1256. B. Wightii Benth. F. B. I. and A. C.
"Beddomo ! 4,000′."

567. Cinnamomum Bl.

1257. C. nitidum Bl. A. C.
Udamanparai.

1258. C. zeylanicum Breyn. No. 3735.
Flowers April. 4,000′—6,500′.

1259. C. multiflorum Wight. A. C.
Iyerpadi.

1260. C. sulphuratum Nees. No. 3352.
Flowers April. In evergreen forest; 5,500′.

1261. C. Wightii Meissn. Nos. 3340, 3726.
Flowers and fruits April. In evergreen forest; 6,000′—7,500′.

568. Machilus Nees.

1262. M. macrantha Nees. No. 3553. Pulaiya *Lavungamaram.*
Flowers February. 3,000′—4,500′.

569. Phœbe Nees.

1263. P. lanceolata Nees. F. S. and A. C.
3,000′—4,000′.

1264. P. paniculata Nees. A. C.
4,000′.

570. Alseodaphne Nees.

1265. A. semicarpifolia Nees. No. 3445.
Flowers May to June. 1,700′.
VAR. **parvifolia** Hook. f.
Flowers May. 2,600′.

571. Actinodaphne Nees.

1266. A. campanulata Hook. f. A. C.

1267. A. hirsuta Hook. f. A. C.
Iyerpadi.

572. Litsea Lam.

1268. L. tomentosa Heyne. No. 3208.
Flowers December. 2,800′.

1269. L. polyantha Juss. A. C.
4,000′.

1270. L. coriacea Heyne. A. C.
Udumanparai.

1271. L. Stocksii Hook. f. A. C.
Iyerpadi.

1272. L. oleoides Meissn. A. C.
Udumanparai.

1273. L. Wightiana Wall. Nos. 3339, 3721.
Flowers April to May; fruits rains. In evergreen forest; 4,000′—7,500′.

1274. L. zeylanica C. & T. Nees.
Flowers May to June. 3,000′—6,000′.

1275. **L. Hookeriana** Hook. f. A. C.
4,000′.

1276. **L. sp.?** No. 3405. Muduva *Manjavarri*.
In dense evergreen forest, Torakadavu valley; 5,000′.

573. Cassytha L.

1277. **C. filiformis** L.
Flowers April. In dense evergreen forest; 3,500′—7,000′. Usually on *Strobilanthes spp.*

CVIII. PROTEACEÆ.

574. Grevillea A. Cunn.

1278. **G. robusta** A. Cunn.
Planted as a shade for coffee and as an ornamental tree. An occasional escape. Flowers during the rains.

CIX. THYMELIACEÆ.

575. Lasiosiphon Fresen.

1279. **L. eriocephalus** Dene. Tamil *Malaivirali*; Pulaiya *Malainanji*.
Flowers December and March; fruits March; 3,300′—7,000′.

CX. ELÆAGNACEÆ.

576. Elæagnus L.

1280. **E. latifolia** L. No. 3420. Tamil *Malaikoya*; Pulaiya *Vellanjelli*.
Flowers May to June and September; fruits September. 1,200′—4,000′.

CXI. LORANTHACEÆ.

577. Loranthus L.

(The generic name for all the *Loranthi* and *Visci* is *Pulluruvai* in Tamil and *Puluruvi* with the Pulaiyas; the name of the host plant is usually prefixed, thus *Teku-pulluruvai* would be any *Loranthus* or *Viscum* growing on *Tectona grandis*).

1281. L. Wallichianus Schultz.
Flowers April and July to August. 2,500′—3,500′.

1282. L. obtusatus Wall.
Flowers April. 3,500′—4,000′.

1283. L. Hookerianus W. & A. No. 3709.
Flowers April. 4,000′.

1284. L. scurrula L.
Flowers November to December. 1,200′—3,000′.

1285. L. tomentosus Heyne.
Flowers December. 2,000′.

1286. L. bracteatus Heyne. No. 3441.
Flowers May. 1,500′.

1287. L. cuneatus Heyne.
Fruits December. 3,000′—4,000′.

1288. L. longiflorus Desrouss.
Flowers February. In the dry eastern region; 1,000′—1,300′.
Var. **falcata** Kurz.
Flowers February, May to June, September and December. Along the foot of the hills and rising to 1,400′. Very common on *Albizzia amara* Boiv.
Var. **pubescens** Hook. f.
Flowers December. 3,000′.

1289. L. elasticus Desrouss.
Flowers and fruits July. Along the foot of the hills, mostly in the drier eastern region.

1290. L. neelgherrensis W. & A. No. 3417.
Fruits June. 3,000′—4,500′.

1291. L. loniceroides L.
Flowers May and September. 1,500—3,000′.

1292. L. capitellatus W. & A.
Flowers May to June ; fruits June. 1,600′—2,800′.

578. Viscum L.

1293. V. verruculosum W. & A. No. 3468.
Flowers May. 3,000′.

1294. V. orientale Willd.
Flowers April to December; fruits September to December. 1,000′—3,000′.

1295. V. capitellatum Sm.
Flowers and fruits December. 2,200′.

1296. V. ramosissimum Wall. No. 3418.
Flowers May to June ; fruits June. 1,000′—4,500′.

1297. V. articulatum Burm.
Flowers during the rains; fruits cold season. 1,200′—3,000′.

1298. V. japonicum Thunb. No. 3322.
Fruits May. Above 6,300′.

CXII. SANTALACEÆ.

579. Thesium L.

1299. T. Wightianum Wall.
Flowers April. On Thanakumalai ; 8,200′.

580. Santalum L.

1300. S. album L.

Flowers February. Near the Travancore frontier in the dry eastern zone; 1,500′. There are a few scattered individuals in this locality, near the village of Thalinji. There are some plantations in Travancore territory not very far from Thalinji and presumably these have sprung up from seeds conveyed by birds or animals.

581. Osyris L.

1301. O. arborea Wall.

Flowers May. 3,000′—4,000′.

CXIII. BALANOPHORACEÆ.

582. Balanophora Forst.

1302. B. indica Wall.

Flowers May. In evergreen forest; 4,000′—6,500′.

CXIV. EUPHORBIACEÆ.

583. Euphorbia L.

1303. E. hypericifolia L.

Flowers and fruits December. 900′—1,300′.

1304. E. pilulifera L.

Flowers and fruits January and May. About 1,200′.

1305. E. rosea Retz.

Flowers and fruits January and May. 1,500′—2,700′.

1306. E. Tirucalli L. No. 3659. Tamil *Pachchankalli*.

Flowers October; fruits May. At the foot of the hills. Much used for hedges.

1307. E. Nivulia Ham. Tamil *Yellaikalli*.

Flowers October to November. 1,200′—2,600′.

1308. E. antiquorum L. Tamil *Vallakalli, Thirugakalli.*
Flowers December to January; fruits January to February. 900′—1,500′. This and the next species are greatly used for the hedges of fields.

1309. E. tortilis Rottl. Tamil *Thirugakalli*.
Flowers February. 900′—1,500′.
(Presumably *E. Tirucalli* L. received its name from the Tamil name *Thirugakalli* and there must have been some confusion, as the Tamil names are as given. *Thirugakalli* presumably should be the correct name for *E. tortilis* only since it conveys approximately the same significance as *tortilis*, but no distinction is made locally between it and *E. antiquorum*).

1310. E. trigona Haw.
Flowers December. 2,500′—3,500′.

1311. E. dracunculoides Lam. Nos. 3487, 3614.
Flowers and fruits June and September; also young unripe fruits seen in February. In the dry eastern region; 1,100′.

1312. E. Rothiana Spreng.
Flowers and fruits January to April. 4,000′.

584. Sarcococca Lindl.

1313. S. pruniformis Lindl.
Flowers April and December. 3,000′—6,500′.

585. Bridelia Willd.

1314. B. retusa Spreng. Tamil *Mullurengai*.
Flowers May, August to September and December; fruits April. 1,000′—4,500′.

1315. B. stipularis Bl.
Flowers November. 2,500′.

586. Cleistanthus Hook. f.

1316. C. collinus Benth.
Fruits June. At the foot of the hills in the West.

587. Actephila Bl.

1317. A. excelsa Muell.-Arg. No. 3708.
Flowers April. In dense evergreen forest; 1,200′.

588. Phyllanthus L.

1318. P. longipes Muell.-Arg.
Flowers May. In dense evergreen forest; 4,200′.

1319. P. Thwaitesianus Muell.-Arg. A. C.

1320. P. reticulatus Poir.
Flowers September; fruits December. 1,000′—1,500′.

1321. P. Emblica L. Tamil *Nelli*.
Flowers April; fruits December. Common in the drier deciduous forests and grass lands; 1,200′—4,500′.

1322. P. Rheedii Wight. A. C.

1323. P. urinaria L. No. 3851.
Flowers and fruits December to January. 2,400′.

1324. P. simplex Retz. No. 3290.
Flowers and fruits April, August, October and December. 1,800′—6,000′.

1325. P. Niruri L.
Flowers December. At the foot of the hills.

1326. P. debilis Ham.
Flowers and fruits January. 4,500′.

589. Glochidion Forst.

1327. G. zeylanicum A. Juss. A. C.
Var. **nitidum** Dalz. & Gibs. No. 3388.
Flowers April; fruits September. 1,000′—2,700′.

1328. G. fagifolium Miq. No. 3404.
Flowers May. In evergreen forest; 3,500′—5,000′.

1329. G. Hohenackeri Bedd.
Flowers April. 3,500′—6,500′.

1330. G. malabaricum Bedd.
Flowers and fruits December. 3,500′.

1331. G. ellipticum Wight. A. C.
Udumanparai.

1332. G. velutinum Wight.
Flowers May. 4,500′.

1333. G. sp.? No. 3301.
Not matched in the Sibpur herbarium. Flowers March. At Iyerpadi 4,000′.

590. Fluggea Willd.

1334. F. microcarpa Bl.
Flowers May. 2,300′—2,800′.

1335. F. leucopyrus Willd.
Flowers June. 1,500′.

591. Breynia Forst.

1336. B. patens Benth.
Flowers May; fruits January. 3,000′—4,000′.

592. Sauropus Bl.

1337. S. albicans Bl. No. 3587.
Flowers May and October; fruits October. In dense evergreen forest; 2,800′—00′.

1338. S. retroversus Wight. A. C.
4,000′.

1339. S. trinervius Muell.-Arg. No. 3308.
Flowers March. In evergreen forest; above 6,000′.

593. Putranjiva Wall.

1340. P. Roxburghii Wall. No. 3485. Tamil *Irukolli*.
Fruits during the rains. In the dry eastern tracts, usually near streams; 1,200′—1,500′.

594. Hemicyclia W. & A.

1341. H. sepiaria W. & A. Nos. 3438, 3620, 3751. Tamil *Virai, Nallavirai*.
Flowers January and May; fruits June. In the dry eastern region; 1,000′—2,000′.

1342. H. venusta Thw. A.C.
Udumanparai.

1343. H. elata Bedd. F.S.

1344. H. Wightii Hook. f. No. 3582.
Flowers May. In dense evergreen forest; 3,000′.

595. Cyclostemon Bl.

1345. C. macrophyllus Bl. F.S.
Common in dense evergreen forest; 2,000′—4,000′.

1346. C. malabaricus Bedd.
Flowers April. In dense evergreen forest; 3,300′.

596. Bischofia Bl.

1347. B. javanica Bl.
1500′-4000′.

597. Aporosa Bl.

1348. A. acuminata Thw. A.C.
Udumanparai.

1349 A. Lindleyana Baill. A.C.
4,000′.

598. Daphniphyllum Bl.

1350. D. glaucescens Bl. F.S.
4,000′ and over.

599. Antidesma L.

1351. A. Ghesaembilla Gaertn. No. 3451. Tamil *Pulianchedi.*
Fruits during the rains. In the moist deciduous forests; 1,800′—2,500′.

1352. A. diandrum Roth. No. 4028. Malasa *Katupuli.*
Flowers April and July; fruits December. 1,800′—2,800′.

1353. A. Menasu Miq. No. 3419.
Flowers April to May; fruits May. 3,000′—4,500′.

600. Baccaurea Lour.

1354. B. courtallensis Mudl.-Arg. F.B.I.
Wight ! and Beddome !

601. Manihot Adans.

1355. M. Glaziovii Muell.-Arg.
Flowers July; fruits November. Planted in some of the estates between 3,000′ and 4,000′ and also at Mount Stuart between 2,000′ and 2,500′, where it comes up as a weed from fallen seed.

602. Jatropha L.

1356. J. gossypifolia L.
Flowers and fruits January. In the dry eastern region; below 1,000′.

1357. J. Wightiana Muell.-Arg. No. 3434.
Flowers February, April to May and September; fruits May to September. 1,000′—1,500′.

1358. J. Curcas L. Tamil *Katukottai.*
Flowers May to June; fruits February. 1,000′—3,000′. Planted as a hedge and run wild.

603. Croton L.

1359. C. reticulatus Heyne. No. 3384.
Flowers April to May and August; fruits May. In dense evergreen forest; 2,400′—4,500′.

1360. C. aromaticus L. Nos. 3591, 3621.
Flowers May; fruits December. 3,000′—5,000′.

1361. C. malabaricus Bedd.
In dense evergreen forest; 2,000′—3,000′.

1362. C. candatus Geisel. No. 3638.
Fruits during the rains. In evergreen forest; 2,400′.

604. Givotia Griff.

1363. G. rottleriformis Griff. Tamil *Vellabuthalai*.
Flowers April when leafless; new leaves end of April; fruits December. On dry rocky slopes; 1,000′—3,500′.

605. Ostodes Bl.

1364. O. zeylanica Muell.-Arg. F.B.I. Beddome!
2,000′—3,000′.

606. Dimorphocalyx Thw.

1365. D. Lawianus Hook.f. No. 3623.
Fruits during the rains. In evergreen forest; 2,200′—4,000′.

607. Agrostistachys Dalz.

1366. A. indica Dalz.
Fruits May. In evergreen forest; 5,000′.

1367. A. longifolia Benth. No. 3713.
Flowers January; fruits hot season. Very common as an understory in the dense evergreen forests; 3,000′—4,500′.

608. Chrozophora Neck.

1368. C. plicata A. Juss.
Flowers June; fruits November to December. 1,000′—1,300′.

609. Claoxylon A. Juss.

1369. C. oligandrum Muell.-Arg. No. 3309.
Flowers March to May. 4,000′—6,500′.

1370. C. Beddomei Hook.f. F.B.I. Beddome !

610. Acalypha L.

1371. A. paniculata Miq.
Flowers and fruits July to August. 1,000′—3,000′.

1372. A. fruticosa Forsk.
Flowers and fruits May to June. 1,200′—1,600′.

1373. A. indica L.
Flowers May and November to December; fruits December to January. Along the foot of the hills.

1374. A. brachystachya Horn. No. 3505.
Flowers during the rains; fruits cold season. Near Mount Stuart; 2,300′.

1375. A. lanceolata Willd. (*A. fallax* Muell.-Arg.)
Flowers July. 1,200′.

1376. A. ciliata Forsk.
Flowers and fruits July to August. 1,000′—2,600′.

611. Adenochlæna Baill.

1377. A. indica Bedd. F.S.
"Flowers and fruits at all seasons, in evergreen forests, generally on the banks of streams, 1,500′—4,000′."

612. Mallotus Lour.

1378. M. albus Muell.-Arg.
Flowers and fruits January. 4,000′.

1379. M. muricatus Bedd. No. 3423.
Flowers and fruits April to June. 1,500′—4,000′.

1380. M. stenanthus Muell.-Arg. A.C.
4,000′.

1381. M. Lawii Muell.-Arg. F.S.

1382. M. Beddomei Hook.f. F.B.I.
Beddome, 4,000′.

1383. M. philippinensis Muell.-Arg.
Flowers October; fruits December to January. 1,000′—4,000′.

613. Cleidion Bl.

1384. C. javanicum Bl. F.S.
In evergreen forest; 2,000′—3,000′.

614. Macaranga Thours.

1385. M. tomentosa Wight. (*M. Roxburghii* Wight.)
Flowers January. 3,000′—4,000′. Springing up abundantly as secondary growth in abandoned clearings in evergreen forest.

615. Homonoia Lour.

1386. H. riparia Lour.
Flowers April; fruits December. Along stream banks and in the beds of rocky streams; 1,800′—2,800′.

616. Ricinus L.

1387. R. communis L.
Cultivated and occasionally found as an escape.

617. Baliospermum Bl.

1388. B. axillare Bl.
Flowers April and December; fruits December. In the moist deciduous forests; 1,800′—2,200′.

618. Tragia L.

1389. T. involucrata L.
Flowers and fruits September to January. 1,800′—4,000′.

619. Excæcaria L.

1390. E. crenulata Wight. No. 3414. Kadir *Skolaishern.*
Flowers May. In evergreen forest; 3,000′—6,000′. The leaves are frequently alternate.

1391. E. robusta Hook.f. Nos. 3425, 3818.
Flowers May; fruits June. 2,400′.

620. Sebastiana Spreng.

1392. S. Chamælea Muell.-Arg.
Flowers and fruits August. 2,000′—3,000′.

CXV. URTICACEÆ.

621. Holoptelia Planch.

1393. H. integrifolia Planch. Tamil *Aya.*
Flowers October; fruits February. Along the foot of the hills.

622. Celtis L.

1394. C. tetrandra Roxb. No. 3741. Pulaiya *Omamaram.*
Fruits June. 2,500′—3,000′.

1395. C. cinnamomea Lindl.
Flowers February; fruits May to June. 1,000′—2,500′.

1396. C. Wightii Planch. No. 3446. Tamil *Kalluvirai.*
Flowers February to May. 1,000′—1,500′.

623. Trema Lour.

1397. T. orientalis Bl.
Flowers December to January; fruits hot season. 1,200′-3,000′.

624. Streblus Lour.

1398. S. asper Lour.
Flowers February: fruits March to April. 1,000′—2,500′.

625. Plecospermum Trécul.

1399. P. spinosum Trécul. No. 4330.
Flowers May. On the Travancore frontier in the East; 2,400′.

626. Dorstenia L.

1400. D. indica Wall.
Flowers October; fruits April. 4,000′.

627. Ficus L.

1401. F. gibbosa Bl. A.C.
Udumanparai.

VAR. **parasitica** King.

Flowers December. 1,000′—3,000′.

1402. F. bengalensis L. No. 3813. Tamil *Ichchi.*
Flowers and fruits May. 1,000′—3,000′.

1403. F mysorensis Heyne.
Tekkdi forest in the West; 1,900′.

1404. F. tomentosa Roxb. Tamil *Kalichchi.*
Flowers May. 1,300′—3,000′.

1405. F. Beddomei King. No. 3245.
Flowers and fruits January. In evergreen forest; 4,000′.

1406. F. Benjamina L. Tamil *Ponichchi*.
Flowers May to June. 1,000′—3,000′.

1407. F. elastica Roxb.
Planted to a small extent in some of the estates; 3,000′—4,000′.

1408. F. retusa L. A.C.
4,000′.

1409. F. nervosa Roth. A.C.
Iyerpadi.

1410. F. religiosa L. Tamil *Arasu*.
Flowers December. 1,000′—3,000′.

1411. F. Arnottiana Miq.
Fruits February. 1,900′—3,000′.

1412. F. Tsiela Roxb.
At the foot of the hills as an avenue tree. According to the A.C. list, also at Udumanparai in evergreen forest.

1413. F. infectoria Roxb.
At about 3,000′.

1414. F. asperrima Roxb.
Fruits May. 3,000′—4,500′.

1415. F. hispida L.
Flowers May. 2,000′—4,000′.

1416. F. guttata Kurz.
6,500′.

1417. F. glomerata Roxb.
Flowers December to January and May; fruits December to January. 1,000′—3,000′.

628. Antiaris Lesch.

1418. A. toxicaria Lesch. F.S. Kadir *Alli*.
Flowers rains; fruits January.

629. Artocarpus Forst.

1419. A. hirsuta Lam.
Flowers May. 1,500′—4,000′.

1420. A. integrifolia L. f. Tamil *Pillamaram.*
Flowers May to July; fruits rains and cold season. In evergreen forest; 2,500′—4,000′.

1421. A. Lakoocha Roxb. A.C.
Udumanparai.

630. Fleurya Gaud.

1422. F. interrupta Gaud.
Flowers September to October. 1,800′—2,500′.

631. Laportea Gaud.

1423. L. crenulata Gaud. English *The Elephant Nettle.*
Flowers and fruits January. In evergreen forest; 3,000′—4,000′ The worst of the stinging nettles; it is justly dreaded by all who frequent these forests.

632. Girardinia Gaud.

1424. G. heterophylla Dene. English *The Nilgiri Nettle.*
Flowers December. 3,000′.

633. Pilea Lindl.

1425. P. muscosa Lindl. No. 3595. English *The Gunpowder Plant.*
Flowers and fruits May. 4,000′. Run wild in the estates.

1426. P. Wightii Wedd. No. 3306.
Flowers and fruits March. 7,500′.

1427. P. stipulosa Miq.
In evergreen forest; 4,000′—5,000′.

1428. P. trinervia Wight.
Flowers January and September. 2,200′—5,400′.

634. Pellionia Gaud.

1429. P. Heyneana Wedd.
Flowers April to May. In evergreen forest; 2,000′—3,500′.

635. Elatostema Forst.

1430. E. sessilis Forst. A.C.
At about 2,600′.

1431. E. lineolatum Wight. No. 3395.
Flowers December to January and April. 3,000′—6,500′.

1432. E. acuminatum Brogn. No. 3586.
Flowers May. In dense evergreen forest; 4,000.′

636. Procris Juss.

1433. P. laevigata Bl. A. C.
"3,500′—4,000′."

637. Pouzolzia Gaud.

1434. P. indica Gaud.
Flowers August and December, fruits December. 2,200′—3,200′.

1435. P. Wightii Benn. No. 3306.
Flowers December and March. 3,000′—7,500′.

1436. P. scabra Wight.
Flowers October. 4,000′.

1437. P. caudata Benn. No. 3859.
Fruits January. Mount Stuart; 2,000′.

1438. P. Bennettiana Wight.
Flowers April. 6,500′.

638. Villebrunea Gaud.

1439. V. integrifolia Gaud.
Fruits March. 4,000′.

VAR. **sylvatica** Hook. f. No. 3550. Pulaiya *Omamara.*
Flowers February : fruits May. 2,800′—5,000′.

1440. V. frutescens Bl. A.C.
4000′.

639. **Debregeasia** Gaud.

1441 D. velutina Gaud.
Flowers December ; fruits March. 3,000′—4,500′.

1442. D. Wallichiana Wedd. No. 3581.
Flowers May. In evergreen forest ; 3,000′.

CXVI. SALICACEÆ.

640. **Salix** L.

1443. S. tetrasperma Roxb. Muduva *Nirvanji*.
Fruits December. Banks of streams ; 2,000′—3,000′.

CXVII. GNETACEÆ.

641. **Gnetum** L.

1444. G. scandens Roxb.
Fruits June. Banks of the Chinnar on the Travancore frontier ; 1,500′.

CXVIII. CONIFERÆ.

642. **Podocarpus.** L'Herit.

1445. P. latifolia Wall. A.C.
Iyerpadi.

CXIX. CYCADACEÆ.

643. **Cycas** L.

1446. C. circinalis L. Muduva *Peyithi*.
Flowers hot season ; fruits rains. 1,500′—3,000′.

MONOCOTYLEDONEAE.

CXX. HYDROCHARIDACEÆ.

644. Blyxa Thouars

1447. B. ceylanica Hook f. A.C.
Udumanparai.

645. Ottelia Pers.

1448. O. alismoides Pers.
Flowers December. At the foot of the hills.

CXXI. BURMANNIACEÆ.

646. Burmannia L.

1449. B. coelestis D. Don.
Flowers December to January. 3,500′.

1450. B. candida Griff.
Flowers December to January. 3,500′.

1451. B. Wallichii Hook. f. No. 3224.
Flowers December to January. 3,500′—4,500′.

CXXII. ORCHIDACEÆ.

647. Oberonia Lindl.

1452. O. iridifolia Lindl. No. 3509.
Flowers December. 3,000′.

1453. O. ensiformis Lindl. No. 3502.
Flowers October. 2,500′.

1454. O. zeylanica Hook. f. No. 3263.
Flowers January. 4,000′.

648. Microstylis Nutt.

1455. M. Wallichii Lindl. F. B. I. Beddome !

649. Liparis Rich.

1456. L. platyphylla Ridl. F. B. I. Beddome ! 3,500'.

1457. L. pusilla Ridl. F. B. I. Beddome !

650. Dendrobium Sw.

1458. D. microbulbon A. Rich. No. 4030.
Flowers December to January. Mount Stuart; 2,200'.

1459. D. nanum Hook. f. No. 3304.
Flowers April to May; fruits May. Above 6,000'.

1460. D. heterocarpum Wall. No. 3675.
Fruits January. 2,000'—3,000'.

651. Cirrhopetalum Lindl.

1461. C. Gamblei Hook. f. Nos 3334, 3725.
Flowers April. Above 6,500'.

652. Eria Lindl.

1462. E. nana A Rich. No. 3803.
Fruits May. 6,500'.

653. Cœlogyne Lindl.

1463. C. glandulosa Lindl. No. 3722.
Fruits April. 6,500'.

654. Calanthe Br.

1464. C. Masuca Lindl.
Flowers May. In dense evergreen forest; 6,500'.

1465. C. veratrifolia Br.
Flowers April to May. 4,000'—7,000'.

655. Eulophia Br.

1466. E. nuda Lindl. No. 3812.
Flowers May, appearing before the leaves, which bud out with the first rains in June. 2,000′—2,500′.

656. Cymbidium Sw.

1467. C. aloifolium Sw. (*C. bicolor* Lindl.) No. 3470.
Fruits May. 2,800′.

657. Luisia Gaud.

1468. L. teretefolia Gaud.
3,000′.

1469. L. tenuifolia Bl. A. C.
About 2,600′.

658. Cottonia Wight.

1470. C. macrostachya Wight. No. 3358.
Flowers April. 2,000′.

659. Ærides Lour.

1471. Æ. radicosum A. Rich. Nos. 3329, 3462.
Flowers April to May and August. 3,000′—8,000′.

660. Vanda R. Br.

1472. V. parviflora Lindl. Nos. 3740, 3756, 3822.
Flowers April to May and July. 2,000′—3,000′.

1473. V. Roxburghii Br. No. 3433.
Flowers May to June. In the dry tracts; 1,000′—1,500″.

661. Saccolabium Bl.

1474. S. filiforme Lindl. F. B. I. Cotton!

662. Thelasis Bl.

1475. T. pygmæa Lindl. No. 3370
Flowers April. 2,000′.

663. Tropidia Lindl.

1476. T. angulosa Sl.
Flowers August. 2,000′.

664. Anæchtochilus Bl.

1477. A. elatior Lindl. A. C.
Udumanparai.

665. Spiranthes Rich.

1478. S. australis Lindl.
Flowers March to April; fruits April. In swampy grass lands; 7,000′—8,000′.

666. Herminium L.

1479. H. goodyeriodes Lindl. (F. B. I.) (*Habenaria goodyeroides* Don) No. 3628.
Flowers August. Mount Stuart; 2,200′.

667. Peristylus Bl.

1480. P. plantagineus Lindl. (*Habenaria Wightii* Trim.) No. 3461.
Flowers July. Mount Stuart; 2,200′.

668. Habenaria Willd.

1481. H. macrostachya Lindl. F. B. I. Beddome!

1482. H. rariflora A. Rich. No. 3453.
Flowers July. Near Mount Stuart; 2,000′—2,500′.

1483. H. Richardiana Wight. A. C.
"About 2,600′."

1484. H. longicornu Lindl.
Flowers October. 4,000′.

1485. H. platyphylla Spreng.
Flowers July. 1,200′.

1486. H. plantaginea Lindl.
Flowers September. 1,800′—2,300′.

1487. H. longicalcarata A. Rich.
Flowers July to August. 2,200′—4,000′.

1488. H. fusifera Hook. f. F. B. I. Beddome !

1489. H. affinis Wight. No. 3506.
Flowers November. 1,900′.

1490. H. ovalifolia Wight. No. 3819.
Flowers July. Near Mount Stuart; 2,500′.

1491. H. marginata Coleb. No. 3766.
Flowers October. In swampy places in the western deciduous forests; 1,800′.

1492. H. obcordata Lind. VAR. **nilagirica** Wight.
(*H. galeandra* Benth. VAR. *nilagirica* Hook. f.)
Flowers April and December. 3,200′—7,500′.

669. Satyrium Sw.

1493. S. nepalense Don.
In marshy places in the grass lands; above 6,000′.

CXXIII. SCITAMINEÆ.

670. Globba L.

1494. G. ophioglossa Wight. F. B. I. Wight ! and Jerdon !

1495. G. bulbifera Roxb.
Flowers July. In the moist western deciduous forests; 1,800′—3,000′.

671. Curcuma L.

1496. C. aromatica Salisb. No. 3355.
Flowers April to May. 3,000′—4,300′.

1497. C. Zeodaria Rosc. No. 3356.
Flowers April. In dense evergreen forest; 3,300′.

1498. C. pseudomontana Grah. (*C. montana* Rosc.) No. 3459.
Flowers July. Mount Stuart; 2,100′.

1499. C. strobilifera Wall. ? No. 3755. Malasa *Panikugai*.
Flowers November. Tekkadi forests; 1,800′.

1500. C. decipiens Dalz. No. 3456.
Flowers July. Tekkadi forests; 2,000′.

1501. C. sp. ? (PROX. *petiolata* ROSC.) No. 3624.
Flowers September. Near Mount Stuart; 2,100′.

672. Hitchenia Wall.

1502. H. caulina Baker. No. 3757.
Flowers July. Mount Stuart; 2,100′.

673. Hedychium Koen.

1503. H. coronarium Koen.
Flowers May, September and December. 2,000′—4,500′.

674. Amomum L.

1504. A. involucratum Benth. No. 3300.
Flowers March and May. 4,000′—5,000′.

1505. A. acuminatum Thw.
Flowers August. 3,500′.

1506. A. microstephanum Baker. No. 3574.
Flowers and fruits May. 3,000′.

1507. A. cannæcarpum Benth. No. 3798.
Flowers and fruits April to May. Iyerpadi; 4,000′.

675. Zinziber Adans.

1508. Z. Wightianum Thw. Nos. 3639, 3758.
Flowers May, July and September. 1,800′—3,000′.

1509. Z. officinale Rosc.
Flowers July. Apparently truly wild in the moist deciduous forests in the West; 2,300′.

1510. Z. Zerumbet Sm. Nos. 3460, 3820.
Flowers July. 2,000′—2,500′.

676. Costus L.

1511. C. speciosus Sm.
Flowers August to October; fruits October to December. In the moist forests; 1,800′—3,000′.

677. Elettaria Maton.

1512. E. Cardamomum Maton.
Flowers January. In dense evergreen forests; 2,500′—4,000′. Also planted on some of the estates.

678. Clinogyne Salisb.

1513. C. virgata Benth.
Flowers April to May, July and September. 2,000′—3,300′.

679. Musa L.

1514. M. sapientum L.
3,000′—4,000′.

CXXIV. BROMELIACEÆ.

680. Ananassa Adans.

1515. A. sativa L.
Cultivated by the Muduvas of Olikadu; 2,000′.

CXXV. HÆMODORACEÆ.

681. Peliosanthes Andr.

1516. **P. neilgherrensis** Wight. No. 3333.
Flowers and fruits April. 6,500′.

682. Ophiopogon Ker

1517. **O. intermedium** Don. No. 3260.
Flowers August; fruits January. 4,000′.

683. Sansevieria Thunb.

1518. **S. zeylanica** Willd. Tamil *Marul.*
In the dry eastern region. 1,000′—1,500′.

CXXVI. AMARYLLIDACEÆ.

684. Hypoxis L.

1519. **H. aurea** Lour.
Flowers May. At Periakulam swamp; 6,200′.

685. Curculigo Gaertn.

1520. **C. Finlaysoniana** Wall. No. 3399.
Flowers April to May. In dense evergreen forest; 3,200′—5,000′.

1521. **C. orchioides** Gaertn.
Flowers April to May. 3,000′—7,000′.

686. Crinum L.

1522. **C. asiaticum** L. No. 3610.
Flowers June. On dry rocky slopes; 1,600′—2,000′.

1523. **C. latifolium** L.
Flowers April to May. 4,000′—4,500′.

687. Pancratium L.

1524. **P. triflorum** Roxb. No. 3647.
Flowers April to May and October. 1,900′—2,200′.

CXXVII. DIOSCORIACEÆ.

688. Dioscorea L.

1525. **D. daemona** Roxb.
Flowers July. Tekkadi forests; 2,000′.

1526. **D. tomentosa** Heyne. Tamil *Shaval-kalangu.*
Flowers October. 2,000′.

1527. **D. penta phylla** L.
Flowers during the rains. In the dry eastern region; 1,300′.

VAR. **Wightii** Prain & Burk. No. 3765.
Flowers October. Tekkadi forests; 1,800′.

1528. **D. oppositifolia** L.
Flowers May and October. 2,000′—4,000′.

1529. **D. bulbifera** L. (*D. sativa* L.) Tamil *Pannu-kalangu.*
Flowers October. In the moist deciduous western forests; 1,800′—2,500′.

CXXVIII. LILIACEÆ.

689. Smilax L.

1530. **S. aspera** L. A. C.
Udumanparai.

1531. **S. zeylanica** L. No. 3599.
Flowers. May. 4,000′—5,000′.

1532. **S. prolifera** Roxb.
Fruits June and September. 1,500′—4,000′.

690. Asparagus L.

1533. **A. racemosus** Willd.
Flowers April. 1,800′—3,000′.

691. Dracaena L.

1534. **D. terniflora** Roxb.
Flowers May; fruits October. 2,000′.

692. Chlorophytum Ker.

1535. **C. tuberosum** Baker

Flowers June and September. In the dry eastern region; 1,100′.

1536. **C. orchidastrum** Lindl. No. 3450.

Flowers July to January; fruits August to January. In the moist deciduous western forests; 1,800′—2,500′.

693. Urginea Steinh.

1537. **U. indica** Kunth. No. 3783.

Flowers February. In the dry eastern region; 1,500′.

1538. **U. Wightiana** Hook. f. No. 3422.

Flowers April to May, when leafless; 2,500′—3,000′.

694. Scilla L.

1539. **S. indica** Baker

Flowers July. 1,000′—2,500′.

695. Lilium L.

1540. **L. neilgherrense** Wight.

In open grass lands; above 6,000′. Not common.

696. Gloriosa L.

1541. **G. superba** L. Tamil *Kannuvelli*.

Flowers August to December. 1,000′—3,500′.

697. Disporum Salisb.

1542. **D. Leschenaultianum** Don. No. 3305.

Flowers March to May. 6,500′.

698. Aloe L.

1543. **A. vera** L.

Flowers September to January. Run wild at the foot of the hills.

CXXIX. PONTEDERIACEÆ.

699. Monochoria Presl.

1544. **M. hastæfolia** Presl.
Flowers October. In swamps in the Tekkadi forests ; 1,800′.

1545. **M. vaginalis** Presl.
Flowers February and September. In swamps in the dry eastern region ; 1,000′.

CXXX. XYRIDACEÆ.

700. Xyris L.

1546. **X. schœnoides** Mart.
Flowers April and December. 3,400′—7,500′.

1547. **X. pauciflora** Willd. No. 4031.
Flowers December. Near Mount Stuart ; 2,000′.

CXXXI. COMMELINACEÆ.

701. Commelina L.

1548. **C. benghalensis** L.
Flowers December. At the foot of the hills.

1549. **C. hirsuta** Clarke.
Flowers April. In open grass lands ; above 6,500′.

1550. **C. nudiflora** L. No. 3858.
Flowers and fruits August to January. In the moist deciduous western forests ; 1,800′—3,000′.

1551. **C. glabra** Clarke. Herb. Calc. Beddome ! and Gamble !.
3,000′.

702. Aneilema Br.

1552. **A. herbaceum** Wall. (*A. lineolatum* Kunth.)
Flowers and fruits September. 2,250′.

1553. **A. dimorphum** Dalz. A. C.
2,600′.

1554. **A. spiratum** Br.
Flowers and fruits December. 3,000′.

1555. **A. paucifiorum** Wight. No. 3503.
Flowers and fruits October to December. 2,000′—2,500′.

1556. **A. giganteum** Br.
Flowers and fruits January. 3,000′.

1557. **A. paniculatum** Wall. No. 3240.
Flowers and fruits December. 3,500′.

1558. **A. montanum** Wight.
Flowers and fruits September to October. 2,500′—4,000′.

1559. **A. scaberrimum** Kunth.
Flowers January and April. 2,000′—3,000′.

703. Cyanotis Don.

1560. **C. cristata** Schultes.
Flowers August and December. 2,000′—3,000′.

1561. **C. arachnoidea** Clarke.
Flowers January. On Ibex Hill, 4,500′.

1562. **C. villosa** Schultes.
Flowers and fruits January. 4,000′.

1563. **C. fasciculata** Schultes. No. 3202.
Flowers and fruits December. 1,000′—3,000′.

1564. **C. axillaris** R. & S.
Flowers July to August. 2,000′—3,000′.

704. Floscopa Lour.

1565. **F. scandens** Lour.
Flowers April. In dense evergreen forests; 3,300′—4,300′.

CXXXII. JUNCACEÆ.

705. Luzula DC.

1566. **L. campestris** DC. F. B. I.
"5,000′—7,000′."

CXXXIII. PALMACEÆ.

706. Caryota L.

1567. **C. urens** L.
Flowers during the rains and cold season. Not very common. 2,000′—4,000′.

707. Phœnix L.

1568. **P. humilis** Royle. Tamil *Icham*.
Flowers January; fruits May. 3,000′—5,000′.

708. Calamus L.

1569. **C. pseudo-tenuis** Becc.
In dense evergreen forest; 2,500′—4,500′.

1570. **C. Rotang** L. No. 3447.
Flowers May. Along the Amaravati river, in the dry eastern region; 1,000′.

709. Borassus L.

1571. **B. flabellifer** L.
Planted and occasionally self sown, at the foot of the hills.

710. Cocos L.

1572. C. nucifera L.
Planted at the foot of the hills.

CXXXIV. PANDANACEÆ.

711. Pandanus L. f.

1573. P. tectorius Soland. (*P. fascicularis* Lam.)
In swampy places and near streams; 1,900′—2,800′.

CXXXV. TYPHACEÆ.

712. Typha L.

1574. T. angustata B. & C.
Flowers rains; fruits September to December. At the foot of the hills.

CXXXVI. ARACEÆ.

713. Cryptocoryne Fisch.

1575. C. ciliata Fisch. No. 3750.
Flowers June. Banks of the Amaravati river; 1,100′.

714. Lagenandra Dalz.

1576. L. toxicaria Dalz. No. 3365.
Flowers April to May; fruits May. In stagnating water, in the wet forests; 1,500′—3,000′.

715. Pistia L.

1577. P. Stratiotes L.
Flowers December. In ponds and wells at the foot of the hills.

716. Arisæma Mart.

1578. A. tortuosum Schott. No. 3564.
Flowers April ; above 6,500′.

1579. A. Leschenaultii Bl.
Flowers April ; above 4,500′.

717. Theriophonum Bl.

1580. T. crenatum Bl.
Near Mount Stuart ; 2,000′—2,400′.

1581. T. Dalzellii Schott. No. 3745.
Flowers June. On dry rocky slopes in the eastern region ; 2,000′.

718. Synantherias Schott

1582. S. sylvatica Schott.
Near Mount Stuart ; 2,400′.

719. Remusatia Schott

1583. R. vivipara Schott. No. 3357.
Flowers April ; 2,800′.

720. Colocasia L.

1584. C. antiquorum Schott
Flowers April. 2,000′—3,500′.

721. Rhaphidophora Schott

1585. R. pertusa Schott
In evergreen forest ; 3,000′.

722. Anaphyllum Schott

1586. A. pertusa Schott
Flowers May and December. In evergreen forest ; 3,000′. A most evil-smelling plant when in flower.

1587. A. Beddomei Engl. No. 3739.
Flowers May. In dense evergreen forest; 4,000′.

723. Pothos L.

1588. P. scandens L.
Flowers April and November. In dense evergreen forest; 2,400′—3,000′.

CXXXVII. LEMNACEÆ.

724. Lemna L.

1589. L. minor L.
At the foot of the hills.

CXXXVIII. ERIOCAULACEÆ.

725. Eriocaulon L.

1590. E. odoratum Dalz. No. 3212.
Flowers April and December. 3,000′—7,500′.

1591. E. cristatum Mart. A.C.

1592. E. Brownianum Mart.
Flowers April; above 6,000′.

1593. E. trilobium Ham. No. 3325.
Flowers April; 7500′.

1594. E. xeranthemum Mart. No. 3458.
Flowers and fruits July. 2,300′.

CXXXIX. CYPERACEÆ.

726. Kyllingia Rottler.

1595. K. triceps Roth.
Flowers November. 1,000′—1,300′.

727. Cyperus L.

1596. C. eragrostis Vahl. (*Pycreus sanguinolentus* Nees). No. 3204.
Flowers December. 3,200′.

1597. C. uncinatus Poir. (*C. cuspidatus* H.B.K.) No. 3203.
Flowers December. 3,300′.

728. Fimbristylis Vahl.

1598. F. monticola Steud. F.B.I. Beddome !

729. Scleria Berg.

1599. S. caricina Benth.
Flowers and fruits December. 2,000′.

730. Carex L.

1600. C. nubigena D. Don. F.B.I.
"5,000′—8,000′."

1601. C. phacota Spreng. No. 3568.
Flowers April. 6,500′

1602. C. baccans Nees. No. 3670.
Flowers December. 3,000′.

CXL. GRAMINACEÆ.

731. Paspalum L.

1603. P. scrobiculatum L.
Flowersy. July 1900′.

1604. P. longiflorum Retz. A.C.

1605. P. Royleanum Ness. A.C.

732. Digitaria Rich.

1606. D. sanguinalis Scop. (*Paspalum sanguinalis* Lam.) A.C.
VAR. **ciliaris** Prain.
Flowers December. At the foot of the hills.
VAR. **Griffithi** Hook.f. Nos. 3631, 3634.
Flowers August to December. 2,200.

733. Isachne Br.

1607. I. Kunthiana W. & A. VAR. **latifolia** Hook.f. F.B.I. Beddome!

1608. I. Gardneri Benth. No. 3343.
Flowers April. 7,600'.

734. Panicum L.

1609. P. villosum Lam. A.C.

1610. P. ramosum L. A.C.

1611. P. indicum L. A.C.

1612. P. semiverticillatum Rottl. F.B.I. Beddome!

1613. P. remotum Retz. F.B.I. Beddome!

1614. P. trypheron Sch. A.C.

1615. P. montanum Roxb.
Flowers December to January. Western moist forests; 2,000'—3,000'.

1616. P. pilipes Nees.
Flowers August and January. Karianshola; 2,400".

735. Axonopus Beauv.

1617. A. cimicinus Beauv. A.C.

736. Oplismenus Beauv.

1618. O. compositus Beauv.
Flowers December to January. 2,200'.

737. Arundinella Raddi.

1619. A. avenacea Munro. A.C.
Iyerpadi.

1620. A. mesophylla Nees. No. 3650.
Flowers October and January. 2,000′—3,000′.

1621. A. agrostoides Trin. A.C.
VAR. **ciliata** Hook.f. No. 3651.
Flowers October. 3,300′.

1622. A. fuscata Nees. A.C.

738. Setaria Beauv.

1623. S. glauca Beauv.
Flowers August. 1,800′—3,000′.

1624. S. verticillata Beauv. A.C.

1625. S. plicata T. Cooke. (*Panicum plicatum* Lam.)
Flowers December. 3,000′.

739. Pennisetum Pers.

1626. P. cenchroides Rich.
Flowers May to June. 1,100′.

740. Trachys Pers.

1627. T. mucronata Pers.
Flowers August. At the foot of the hills.

741. Tragus Haller.

1628. T. racemosus Scop.
Flowers December. At the foot of the hills.

742. Perotis Ait.

1629. P. latifolia Ait. Tamil *Kudraival.*
Flowers February. At the foot of the hills.

743. Coix L.

1630. C. Lachryma-Jobi L.
Flowers October, January and May; fruits May. 2,000′—4,000′.

744. Imperata Cyrill.

1631. I. arundinacea Cyrill.
Fruits April. 3,500′.

745. Pollinia Trin.

1632. P. phæothrix Hack. A.C.

746. Ischæmum L.

1633. I. ciliare Retz. No. 3268.
Flowers January. 4,000′.

1634. I. hirtum Hack. No. 3232.
Flowers December. 2,400′.

747. Pogonatherum Beauv.

1635. P. crinitum Trin.
Flowers December. 3,000′.

748. Apluda L.

1636. A. varia Hack.
Flowers January. 2,250′.

749. Rothbœllia L. f.

1637. R. exaltata L. f.
Flowers August. 1,800′.

750. Manisuris Sw.

1638. M. granularis L.
Flowers and fruits August. 2,200′.

751. Andropogon L.

1639. A. Schmidii Hook. f.
Flowers December to January. Mount Stuart; 2,200′.

1640. A. contortus L.
Flowers August to December; fruits December. 1,200′—3,000′.

1641. A Nardus L. No. 3330.
Flowers April. 3,000′—6,500′.

752. Themeda Forsk.

1642. T. Cymbaria Hack. (*Anthistiria Cymbaria* Roxb.)
Flowers January. 2,300′.

753. Garnotia Brongn.

1643. G. tenuiglumis Stapf. No. 3228.
Flowers December. 3,500′.

754. Sporobolus Br.

1644. S. diander Beauv.
Flowers December. Mount Stuart; 2,100′.

755. Cynodon Pers.

1645. C. dactylon Pers.
Flowers June. At the foot of the hills.

756. Chloris Sw.

1646. C. incompleta Roth. No. 3770.
Flowers October. 2,000′.

1647. C. barbata Sw.
Flowers June. 1,200′.

757. Eleusin Gærtn.

1648. E. coracana Gærtn. Tamil *Ragi*.
Cultivated along the foot of the hills and to a small extent by the hillmen.

1649. E. verticillata Roxb.
Flowers July. 2,200′.

758. Phragmites Trin.

1650. P. Karka Trin. No. 3661.
Flowers December. 1,000′—2,600′.

759. Eragrostis Beauv.

1651. E. amabilis W. & A.
Flowers July and December; fruits December. 2,000′—3,000′.

1652. E. bifaria Wight. A. C.

1653. E. coromandeliana Trin.
Flowers August and December. 1,000′—2,300′.

760. Oropetium Trin.

1654. O. Thomœum Trin.
Fruits February. In the dry eastern region; 1,200′.

761. Arundinaria Mich.

1655. A. Wightiana Nees.
Along streams in the open grass lands; above 6,500′.

762. Bambusa Schreb.

1655. B. arundinacea Willd. Tamil *Peru-mungil*.
Flowers Februaryto March; fruits April. Throughout the hills from 1,200′—3,500′. Attaining a very large size in the moist western forests; up to 7½″ diameter. There was a very general flowering in the eastern half in 1313 and 1914.

763. Oxytenanthera Munro.

1657. **O. Thwaitesii** Munro. F. S. 3,500′—6,000′.
1658. **O. monostigma** Bedd. F. S.

764. Dendrocalamus Nees.

1659. **D. strictus** Nees. Tamil *Siru-mungil.*
Flowers February to March; fruits April. 1,000′—1,500′.

765. Ochlandra Thw.

1660. **O. travancorica** Benth. Tamil *Odai.*
Forming dense thickets, especially along streams, in the wet forests; 1,500′—5,000′.

CRYPTOGAMIA.

PTERYDOPHYTA.

CXLI. GLEICHENIACEÆ.

766. Gleichenia Sm.

1661. **G. linearis** Burm.
Up to 6,000′.

CXLII. POLYPODIACEÆ.

767. Alsophila Br.

1662. **A. latebrosa** Hook.
Spores April. In evergreen forest; 6,000′—7,500′.

1663. **A. glabra** Hook. Ferns.
"Up to 4,000′."

1664. A. crinita Hook.
Spores April. 5,000′—7,500′.

768. Peranema Don.

1665. P. cyathioides Don. Ferns.
6,000′.

769. Hymenophyllum L.

1666. H. exsertum Wall. No. 3583.
Spores May. On tree trunks in evergreen forest; 3,300′.

1667. H. javanicum Spreng. Ferns.
"Up to 4,000′."

770. Trichomanes Sm.

1668. T. neilgherrense Bedd. Ferns.

1669. T. bipunctatum Poir. No. 3403.
Spores May. Banks of the Torakadavu, 4,000′.

1670. T. rigidum Sw. Ferns.
"Moist dark localities, 3,000′—4,000′."

771. Leucostegia Presl.

1671. L. immersa Wall. Ferns.
3,000′—4,000′, rather rare.

1672. L. pulchra Don. Ferns.
Common on tree trunks in the teak forests.

772. Prosaptia Presl.

1673. P. Emersoni Presl. Ferns.
"3,000′—4,000′ rare."

1674. P. contigua Sw. Ferns.
"On trees and rocks. Banks of the Toracadoo river, at an elevation of 4,500′—a rare fern."

773. Davallia Sm.

1675. D. bullata Wall. No. 3376.
Spores April. On tree trunks; 2,000′—3,000′.

774. Microlepia Presl.

1676. M. pinnata Cav. Ferns.
Rare.

1677. M. platyphylla Don. Ferns.
Not common.

1678. M. speluncæ L.
Spores April. 7,000′.

775. Stenoloma Fee.

1679. S. chinensis Sw. Ferns.

776. Lindsaya Dryand.

1680. L. cultrata Sw.
Spores April. 7,000′—8,000′.

777. Adiantum L.

1681. A. lunulatum Burm.
Spores July. 2,000′—3,000′.

1682. A. caudatum L.
Spores December. 1,000′—3,000′.

1683. A. hispidulum Sw. No. 3392.
Spores May and December. 2,500′—4,000′.

778. Cheilanthes Sw.

1684. C. mysorensis Wall.
Spores April, September and December. 1,000′—3,000′.

1685. C. varians Wall. Ferns.
Rare.

1686. C. tenuifolia. Sw.
Spores July and December. 2,000′—3,000′.

1687. C. farinosa Kaulf.
Spores May. 4,000′—6,000′.

779 Pellæa Link.

1688. P. boivini Hook. Ferns.
"Dry rocky places. 4,000′."

1689. P. falcata Fée. Ferns.
"In moist woods, 3,000′—4,000′."

780. Pteris L.

1690. P. cretica L. Ferns.
"Very common on the higher ranges."

1691. P. pellucida Presl.
Spores April and August. 2,000′—2,500′.

1692. P. quadriaurita Retz.
Spores April. Common in moist forests.

VAR. **argentea** Bedd.
Spores April. 4,000′—7,000′.

1693. P. patens Hook.
Spores May. 4,500′.

1694. P. longipes Don. Ferns.
"2,500′—4,000′."

1695. P. aquilina L.
Spores April to May. Above 4,000′.

781. Campteria Presl.

1696. C. Kleiniana Presl. Ferns.
"4,000′—5,000′."

782. Lithobrochia Presl.

1697. L. incisa Thunb.
Spores May. In wet forests; 3,300′.

783. Ceratopteris Brong.

1698. C. thalictroides L.
Spores October. In the moist western forests; 1,800′—2,000′.

784. Lomaria Willd.

699 L. Patersoni Spreng. Ferns.
"5,000′—8,000′."

785. Blechnum L.

1700. B. orientale L.
Spores January to April. In wet forests; 1,900′—,4,000′.

786. Thamnopteris Presl.

1701. T. Nidus 3, VAR. **phyllitidis** Don. Ferns.
Moist woods; 3,000′—4,000′.

787. Asplenium. L.

1702. A. ensiforme Wall.. Ferns.
"Banks of Torakadavu stream, 4,500′—rare."

1703. A. normale Don.
Spores May. In evergreen forest; 3,000′—6,000′.
VAR. B. Bedd. Ferns.
"4000′".

1704. A. Wightianum Wall. Ferns.
"2,000′—4,000′."
VAR. **microphyllum** Baker. Ferns.
"Banks of Torakadu and elsewhere."

1705. A. tenerum Forst. No. 3379.
Spores April. In dense evergreen forest; 3,000′.

1706. A. lunulatum Sw.
Spores April, 6,500′.
VAR. **trapezæforme** Bedd. Ferns.

1707. A. Zenkerianum Kze. No. 3,402

Spores April to May. Above 5,000′. Occasionally with a casual pinnæ orbicular, crenate, about 1″ diameter.

1708. A. auritum Sw. Ferns.
"On rocks in the bed of the Torakadco river, 4,000′."

1709. **A. crinicaule** Hance. Ferns.
"3,000′—4,000′."

1710. **A. falcatum** Lam. No. 3375.
Spores April. On tree trunks; 2,000′.

1711. **A. macrophyllum** Sw. VAR. **urophyllum** Bedd. Ferns.
"On rocks and trees, 2,000′—4,000′."

1712. **A. caudatum** Forst. Ferns.
"3,000′."

1713. **A. formosum** Willd. Ferns.
"Moist woods at the higher elevations."

1714. **A. unilaterale** Lam. VAR. **rivale** Bedd. Ferns.
"Only in beds of rivers."

1715. **A. furcatum** Thunb.
Spores May. In evergreen forest; 5,000′.

1716. **A. tenuifolium** Don. Ferns.
"Higher ranges."

788. **Athyrium** Roth.

1717. **A. Hohenackerianum** Kze. Ferns.
"Up to 4,000′."

1718. **A. falcatum** Bedd. Ferns.
"Dry grassy places, 5,000′."

1719. **A. macrocarpum** Bl. Ferns.
"Above 3,000′."

1720. **A. Filix-foemina** Bernh. No. 3346.
Spores April. In swamps; 6,500′.

789. **Diplazium** Sw.

1721. **D. speciosum** Mett. No. 3382.
Spores April. In moist forests; 3,300′.

1722. **D. polypodioides** Mett. Ferns.
"In some part of the Anaimalais it is quite a tree fern."

1723. **D. latifolium** Don. Ferns.

790. Anisogonium Presl.

1724. **A. esculentum** Presl. Ferns.
"Banks of streams."

791. Actiniopteris Link.

1725. **A. dichotoma** Forsk.
Spores January and September. 1,000'—3,000'.

792. Polystichum Roth.

1726. **P. aculeatum** Sw.
At about 4,000'.

793. Aspidium Sw.

1727. **A. polymorphum** Wall. Ferns.
"3,000'."

1728. **A. cicutarium** Sw.
Spores July to August. 2,000'—4,000'.

794. Pleocnemia Presl.

1729. **P. Trimeni** Bedd. Ferns.

795. Lastrea Presl.

1730. **L. amabilis** Bl. Ferns.
"3,000'—4,000', not common."

1731. **L. aristata** Sw. Ferns.
"Very common."

1732. **L. hirtipes** Bl. Ferns.

1733. **L. calcarata** Bl. VAR. **ciliata** Wall.
Spores May. Beds of streams; 2,000'—4,000'.

1734. **L. syrmatica** Willd. Ferns.
"Rare."

1735. **L. flaccida** Hook. Ferns.
"3,000'."

1736. L. odontoloma Moore. Ferns.
"Above 5,000′."

1737. L. Filix-mas L. Ferns.
"Higher elevations."

VAR. **elongata** Hook. & Grev. Ferns.
"5,000′ and upwards."

VAR. **cochleata** Don. Ferns.
"2,500′—4,000′."

1738. L. deparioides Moore. Ferns.
"Rare, 2,000′."

1739. L. crenata Forst. Ferns.
"5,000′, rare."

1740. L. dissecta Forst. Ferns.

1741. L. Boryana Willd. Ferns.
"3,000′."

796. Nephrodium Schott.

1742. N. Otaria Kze. Ferns.
"Abundant in teak forest, 1,000′—4,000′, appearing in the rainy season."

1743. N. unitum L. Ferns.
"Not very common, in swamps, 3,000′."

1744. N. pteroides Bl. Ferns.
"Moist forests and outskirts of sholas, 2,000′—4,000′."

1745. N. extensum Bl. Ferns.

1746. N. Arbuscula Desv. No. 3364.
Spores April. Beds of streams; 3,000′—4,000′.

1747. N. pennigerum Bl.
Spores April. 4,000′.

1748. N. molle Desv.
Spores April. 4,000′—4,500′.

797. Nephrolepis Schott.

1749. N. cordifolia L.
Spores January and August. 2,500′—4,500′.

1750. N. exaltata Schott. No. 3294.
Spores December and April. 1,900′—3,300′.

798. Oleandra Cav.

1751. O. neriiformis Cav. Ferns.
"Rare."

1752. O. musæfolia Kze. Ferns.
"In dense evergreen forest at 4,000′, rare."

799. Polypodium L.

1753. P. parasiticum Mett. Ferns.
"Common on trees, 5,000′."

1754. P. obliquatum Bl. Ferns.
"Tórakadu valley, 5,000′."

1755. P. subfalcatum Bl. Ferns.
"Torakadu valley, 4,500′."

800. Niphobolus Kaulf.

1756. N. Gardneri Mett. Ferns.
"5,000′."

1757. N. nummulariæfolius Sw. Ferns.
"Common in the lower forests."

801. Drynaria Bory.

1758. D. quercifolia L.
Spores April, July and December. 1,800′—2,300′.

802. Pleopeltis H. & B.

1759. P. linearis Thunb.
Spores May to September. 3,000′—6,200′.

1760. P. membranacea Don.
Spores May. In dense evergreen forest; 4,000′.

1761. P. punctata L.
Spores April. In dense evergreen forest; 3,000′.

1762. P. pteropus Bl. VAR. **minor**. No. 3371.
Spores April. 1,900′—4,000′.

1763. P. hastata Thunb.
Spores April to May. 3,000′—7,000′.

1764. P. leiorhiza Wall. No. 3383.
Spores April. On tree trunks; 4,000′.

803. Gymnogramme Desv.

1765. G. Totta Schl. No. 3401.
Spores May. In dense evergreen forest; 5,000′.

804. Loxogramme Presl.

1766. L. involuta Don.
Spores April. In evergreen forest; 3,000′.

805. Meniscium Schereb.

1767. M. triphyllum Sw. Ferns.
"Gregarious and forming very large beds, 2,000′—3,000′."

806. Antrophyum Kaulf.

1768. A. reticulatum Kaulf. Ferns.
"3,000′, rather rare."

807. Vittaria Sm.

1769. V. elongata Sw. No. 3374.
Spores April to May. Along streams; 2,000′—3,300′.

808. Drymoglossum Presl.

1770. D. piloselloides Presl. No. 3467.
Spores August. 2,800′.

809. Hemionitis L.

1771. **H. arifolia** Burm.
Spores September to December. 2,000′—4,000′.

810. Elaphoglossum Schott.

1772. **E. latifolium** Sw. Ferns.
"On trees on the higher ranges."

1773. **E. stigmatolepis** Fée. Ferns.
"Common in ravines at no great elevation."

1774. **E. viscosum** Sw.
Spores May to December. 2,600′.—3,600′.

1775. **E. squamosum** Sw. Ferns.
"3,000′—4,000′, not common."

811. Stenochlæna J. Sm.

1776. **S. palustre** L. Ferns.
"Moist forests up to 4,000′."

812. Polybothrya H. B. K.

1777. **P. appendiculata** Willd. Ferns.
"Moist evergreen forests at no great elevation".
VAR. **asplenifolia** Bory. Ferns.
"Moist evergreen forests up to nearly 4,000′."

813. Gymnopteris Bernh.

1778. **G. variabilis** Hook.
Spores April. 7,500′.

1779. **G. quercifolia** Retz. Ferns.

1780. **G. contaminans** Wall. No. 3515.
Spores March to December. In dense evergreen forest; 2,500′—4,000′.

CXLIII. OSMUNDACEÆ.

814. Osmunda L.

1781. **O. regalis** L.
Spores April. Along streams; above 6,000′.

CXLIV. SCHIZAEACEÆ.

815. Anemia Sw.

1782. **A. tomentosa**, Sw. Ferns.
"Dry rocky places, 4,000′."

816. Lygodium.

1783. **L. flexuosum** Sw. No. 3500.
Spores October. 1,800′—2,500′.

CXLV. MARATTIACEÆ.

817. Angiopteris Hoffm.

1784. **A. evecta** Hoffm.
Spores March to April. Wet forests; 3,000′—4,000′.

818. Marattia Sm.

1785. **M. fraxinea** Sm. No. 3585.
Spores May. In evergreen forest; 4,000′.

CXLVI. OPHIOGLOSSACEÆ.

819. Ophioglossum L.

1786. **O. nudicaule** L. f. Ferns.
"In wet grassy places, 2,500′."

1787. O. fibrosum Schum. Ferns.
"In swampy places in teak forest, 2,000′—3,000′."

1788. O. reticulatum L. No. 3762.
Spores September to October. Mount Stuart; 2,200′.

820. Helminthostachys Kaulf.

1789. H. zeylanica L. Ferns.
"Moist bamboo clumps in teak forest, 2,000′—3,000′."

821. Botrychium Sw.

1790. B. daucifolium Wall. Ferns.
"3,000′."

CXLVII. MARSILIACEÆ.

822. Marsilia L.

1791. M. minuta L.
Conceptacles January. 1,000′.

CXLVIII. LYCOPODIACEÆ.

823. Lycopodium L.

1792. L. cernuum L.
4,000′—7,000′.

1793. L. phlegmaria L.
On trees in moist forests; 1,900′.

1794. L. Selago L. No. 3317.
Sporophores March. 3,000′.

824. Psilotum Sw.

1795. P. triquetrum Sw.
3,200′.

CXLIX. SELAGINELLACEÆ.

825. Selaginella Spring.

1796. S. rupestris Spring. No. 3229.
Sporangia December. On rocks; 3,500′.

1797. S. plumosa Baker. No. 3271.
Sporangia January. In wet woods; 4,000′—5,000′.

1798. S. caulescens Spring. No. 3640.
Sporangia September.

BRYOPHYTA.

826. Pogonatum Palis.

1799 P. Teysmannianum Doz. & Molk. No. 3266.
Sporophores January. On soil banks; 4,000′.

827. Rhizogonium Brid.

1800. R. spiniforme L. No. 3411.
Sporophores May. On rocks; 5,000′.

828. Funaria Schreb.

1801. F. hygrometrica Sibth. No. 3211.
Sporophores December On rocks; 3,000′.

829. Bryum Dill.

1802 B. argenteum L. VAR. **lanatum** B. & S. No. 3210.
Sporophores December. On rocks; 3,000′.

VAR. **australe** Rehm. 3412.
Sporophores May. On rocks; 5,000′.

830. Erythrodontium Hamp.

1803. E. julaceum Par. Nos. 3231, 3239.
Sporophores December. On fallen tree trunks; 2,500′—3,000′.

831. Macromitrium Brid.

1804. M. sulcatum Brid.
Sporophores January. On tree trunks; 4,000′.

FUNGI.

832. Gambleola.

1805. G. cornuta Mass.
On *Mahonia Leschenaultiana* Tak.

833. Uncinula Lev.

1806. U. tectonæ Salmon.
On *Tectona grandis* L.

834. Puccinia Persoon.

1807. P. aggregata Syd.
On *Strobilanthes barbatus*. Nees.

835. Ædidium.

1808. Æ. bicolor Sacc.
On *Maba buxifolia* Pers.

836. Uromyces Link.

1809 U. melothriæ P. Hems.
On *Melothria zeylanica* C. B. Clarke.

837. Polystictus Fries.

1810. P. sanguineus Fr.
Carpophores January. Tekkadi forest; 1,900′. On dead twigs.

838. Trametes Fries.

1811. T. lobata Berk.
Carpophores January. Tekkadi forests; 1,900′. On dead twigs.

APPENDIX A.

Additional species from "The Flora of the Presidency of Madras" by J. S. Gamble, C.I.E., F.R.S., and from "A Revision of the Indian Species of *Rotala*" by Father E. Blatter and Dr. Hallberg. (Journal of the Bombay Natural History Society, Vol. XXV, page 709.)

NOTE: The serial numbers are in continuation of the original list and those in brackets denote the place they should occupy in it.

XXXV. CELASTRACEÆ.

1812. (292 a) Microtropis Stocksii Gamble.
Barber.

1813. (301 a) Elæodendron paniculatum W. & A. (*E. glaucum* Pers. *in part*).

1814. (302 a) Salacia Beddomei Gamble.
Beddome'

XXXVII. VITACEÆ.

1815. (320 a) Tetrastigma sulcatum Gamble n. comb. (*Vitis sulcata* Laws.)
Up to 4,500'.

1816. (320 b) Tetrastigma muricatum Gamble n. comb. (*Vitis lanceolaria* Laws in part.)

1817. (316 a) Ampelocissus araneosa Planch. (*Vitis araneosa* Laws.)
Up to 4,500'.

1818. (316 b) Ampelocissus latifolia Planch. (*Vitis latifolia* Roxb.)

1819. (321 a) Cayratia auriculata Gamble n. comb. (*Vitis auriculata* Wall.)

1820. (322 a) Leea Wightii C. B. Clarke.
It is very possible that this is my No. 3808—see under *Leea aspera* Wal No. 322 of list.

1821. (324 a) Leea Venkobarowii Gamble.
This may be my No. 3494—see under *Leea setaligera* Clarke No. 324 of list.

XXXVIII. SAPINDACEÆ.

1822. (339 b) Turpinia malabarica Gamble.

1823. (330 a) Allophylus concanicus Radlk. VAR. **lanceolatus** Gamble "Up to 4,000'."

1824. (332 a) Sapindus emarginatus Vahl. (*S. trifoliatus* Hiern in part)

XL. ANACARDIACEÆ.

1825. (354 a) Nothopegia Heyneana Gamble (*N. Colebrookiana* Bl. VAR. *Heyneana* Hook. f.)

1826. (354 b) Nothopegia Dalzellii Gamble (*N. Colebrookiana* Bl. in part).

XLII. CONNARACEÆ.

1827. (359 a) Connarus sclerocarpus Schellenb. (*Rourea ? sclerocarpa* W. & A.)
"Up to 3,000'."

XLIII. LEGUMINOSÆ.

1828. (365 a) Crotolaria Fysonii Dunn.

1829. (380 a) Crotolaria multiflora Benth.
"Beddome ! At 5,000'."

1830. (387 a) Crotolaria lævigata Lam.
"Up to 3,000'."

1831. (408 a) Tephrosia pulcherrima Wight, (*T. tinctoria* Pers. VAR. *pulcherrima* Baker.)

1832. (417 a) Smithia sensitiva Ait.

1833. (417 b) Smithia hirsuta Dalz. (*S. blanda* Wall. VAR. *racemosa* Baker in part).

1834. (417 c) Smithia blanda Wall.
"4,000'—6,000'."

1835. (417 d) Smithia capitata Dalz.
"2,000'-3,000', in open grass lands."

1836. (423 a) Alysicarpus racemosus Benth. (*A. belgaumensis* Wight, VER. *racemosus* Baker.)
"3,000'—7,000'."

1837. (430 a) Desmodium laxum DC.
"Up to 3,000'."

1838. (432 a) Desmodium wynaadense Bedd.
"2,000'—5,000'."

1839. (464 a) Dunbaria Heynei W. & A.
"Up to 3,000'."

LII. LYTHRACEÆ.

(593 a) Rotala Fysonii Blat. & Hallb.
"Anamallais, 2,000'."

This is almost certainly my No. 3218 (No. 593 of the list). Mr. C. C. Calder has kindly compared my No. 4029 with Mr. Fyson's type sheet and finds them identical.

I have recently found the same species at Horsleykonda in the Chittoor District at 3,500'.

The total number comes to 1841 for 2 varieties as included in original list now take specific rank (Nos. 410 and 446 in Appendix B).

APPENDIX B.

Changes in nomenclature proposed in :

(i) The Flora of the Presidency of Madras by J. S. Gamble, C.I.E., F.R.S.

298. **Kurrimia bipartita** Laws. becomes *K. indica* Gamble n. comb.

Family *Celastraceæ* in part becomes *Hippocrateaceæ*.

309. **Scutia indica** Brong. becomes *S. myrtina* Kurz.

Genus *Vitis* L. in part becomes *Tetrastigma* Planch.

320. **Vitis lanceolaria** Roxb. becomes *Tetrastigma lanceolarium* Planch.

Genus *Vitis* L. in part becomes *Ampelocissus* Planch.

316. **Vitis tomentosa** Heyne becomes *Ampelocissus tomentosa* Planch.

Genus Vitis L. in part becomes *Parthenocissus* Planch.

318. **Vitis anamalayana** Bedd. becomes *Parthenocissus neilgherriensis* Planch.

Genus *Vitis* L. in part becomes *Cissus* L. (modified).

311. **Vitis quadrangularis** Wall. becomes *Cissus quadrangularis* L.

312. **Vitis repens** W. & A. becomes *Cissus repens* Lam.

315. **Vitis Linnæi** Wall. becomes *Cissus vitiginea* L.

313. **Vitis discolor** Dalz. becomes *Cissus discolor* Bl.

314. **Vitis gigantea** Bedd. becomes *Cissus gigantea* Planch.

Genus *Vitis* L. in part becomes *Cayratia* Juss.

321. **Vitis pedata** Vahl. becomes *Cayratia pedata* Juss.

317. **Vitis trifolia** L. becomes *Cayratia carnosa* Gagnep.

Family *Sapindaceae* in part become *Staphyleaceæ*.

339. **Turpinia pomifera** DC. in part becomes *Turpinia nepalensis* Wall.

330. **Allophylus Cobbe** Bl. in part becomes *Allophylus Rheedii* Radlk.

Genus *Hemigyrosa* Bl. becomes *Lepisanthes* Bl.

329. **Hemigyrosa canescens** Thw. becomes *Lepisanthes tetraphylla* Radlk.

328. **Hemigyrosa deficiens** Bedd. becomes *Lepisanthes deficiens* Radlk.

Genus *Sapindus* L. in part becomes *Thraulococcus* Radlk.

333. **Sapindus erectus** Hiern becomes *Thraulococcus erectus* Radlk.

Genus *Sapindus* L. in part becomes *Aphania* Bl.

334. **Sapindus bifoliatus** Hiern becomes *Aphania bifoliata* Radlk.

356. **Spondias acuminata** Roxb. is reduced to a small-leaved form of *S. mangifera* Willd.

354. **Nothopegia Colebrookiana** Hook. f. in part becomes *N. Beddomei* Gamble.

357. **Moringa pterygosperma** Gaertn. becomes *M. oleifera* Lam.

390. **Cyamopsis psoralioides** DC. becomes *C. tetragonoloba* Taub.

401. **Indigofera Houer** Forst. becomes *I. articulata* Gouan.

410. **Tephrosia purpurea** Pers. VAR. **maxima** Baker becomes *T. maxima* Pers.

411. **Tephrosia villosa** Pers. becomes *T. hirta* Ham.

417. **Smithia blanda** Wall. VAR. **racemosa** Baker becomes *S. racemosa* Heyne.

433. **Desmodium parviflorum** Baker part in becomes *Alysicarpus parviflorus* Dalz.

440. **Teramnus labialis** Spreng. VAR. **mollis** Baker becomes *T. mollis* Benth.

446. **Galactia tenuiflora** W. & A. VAR. **villosa** Baker becomes *G. villosa* W. & A.

476. **Flemingia vestita** Benth. VAR. **nilgheriensis** Baker becomes *Flemingia nilgheriensis* Wight.

(ii) A Revision of the Indian Species of *Rotala* by Father E. Blatter and Dr. Hallberg.

Genus *Ammannia* L. in part becomes *Rotala* L.

589. **Ammannia pentandra** Roxb. becomes *Rotala pentandra* Blat. & Hallb. n. comb.

588. **Ammannia peploides** Spreng. becomes *Rotala indica* Blat. & Hallb. n. comb.

ADDENDUM.

Since the above note went to the press I have had another opportunity of visiting the Anaimalais Hills and also the 3rd part of Gamble's "Flora of the Presidency of Madras" has been issued. From these two sources I am able to add the following 17 new species and varieties to the list. Those found by me are indicated by an asterisk.

RUTACEÆ.

*1. **Paramignya monophylla** Wight.
In evergreen forest at Karian shola; 2,500.

LEGUMINOSÆ.

2. **Cassia Leschenaultiana** DC. (*C. mimusoides* Linn. VAR. *Wallichiana Baker*).
"Up to 6,000'."

CRASSULACEÆ.

3. **Kalanchoe floribunda** W. & A. VAR. **glabra** C. B. Clarke.
"At 2,000—4,000'."

MELASTOMACEÆ.

4. **Memecylon molestum** Cogn. (*M. edule* Roxb. VAR. *molesta* C. B. Clarke).
"At about 6,000'."

ONAGRACEÆ.

5. **Ludwigia prostrata** Roxb.
"Swamps in the Anamalais at 2,000'. (Beddome)."

SAMYDACEÆ.

6. Casearia coriacea Thw.
"Shola forests above 6,000′."

CUCURBITACEÆ.

7. Trichosanthes anamalayana Bedd.
"In the Anamalai Hills at 4,4000′."

BEGONIACEÆ.

8. Begonia anamallayana Bedd.
"Anamalai Hills, in the moist forests, at 3,000′."

UMBELLIFERÆ.

9. Heracleum aquilegifolium C. B. Clarke.
"In the Anamalai forests (Wight)."

10. Heracleum Candolleanum Gamble n. comb. (*H. rigens* Wall. VAR. *Candolleana* C. B. Clarke).
"Anamalai Hills, above 6,000′, common."

CORNACEÆ.

***11. Alangium Lamarckii** Thw. VAR. *prox* **glanduosa** No. 4469. Fruits August. In evergreen forest at Karianshola; 2,500′.

EUPHORBIACEÆ.

***12. Phyllanthus indicus** Muell.-Arg. No. 4464. Fruits August. In evergreen forest at Karianshola 2,500.

URTICACEAE.

***13. Ficus Dalhousiæ** Miq. No. 4468 Tamil *Pey-yal*. Flowers August. River banks in rocky places, near Mount Stuart; 2,000′.

ORCHIDACEAE.

***14. Pholidota imbricata** Lindl. No. 4473.
Flowers August. Near Mount Stuart ; 2,500'.

***15. Polystachya Wightii** Reichb. No. 4480.
Flowers August. In dense, evergreen forest at Karianshola ; 2,500'.

***16. Aphyllorchis Prainii** Hook. f. No. 4479.
Flowers August. In dense, evergreen forest at Karianshola ; 2,500'. (This may prove to be *A. montana*).

***17. Habenaria digitata** Lindl. No. 4474.
Flowers August. In the open, near sheet rock, near Mount Stuart ; 2,800.'

SGPI—16D281—30-9-21—

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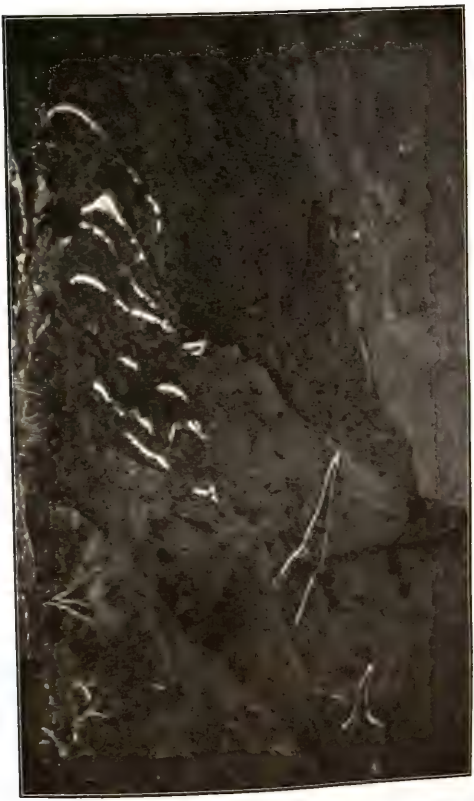

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EUPHORBIACEAE NOVAE E PENINSULA MALAYANA.

BY

A. T. GAGE.

Actephila, Bl.

A. ovalis (Ridley). Comb. nov. *Dimorphocalyx ovalis* Ridley in Journ. Straits Br. Roy. Asiat. Soc., No. 59, 178 (1911).

This species superficially resembles a *Dimorphocalyx*, but the 2-ovuled loculi of the ovary, the minute petals, hairy ovary, undivided styles and characteristic seed declare it a species of *Actephila*.

PERLIS: on Kanya, *Ridley* 14890. LANGKAWI: Coah, *Curtis*.

Phyllanthodendron, Hems.

P. dubium (Ridley). Comb. nov. *Cleistanthus? dubius* Ridley in Journ. Roy. Asiat. Soc. Straits Br., No. 59, 168 (1911). *Glochidion flavum* Ridley loc. cit. 173.

riaceum **P. ~~dubium~~** Frutex scandens ad 12m. longus. Ramuli subteretes, 2-5mm. crassi, primo parce puberuli deinde glabri, cinerei; internodia ·5-2cm. longa. Lamina oblonge elliptica, 5·5-14cm. longa, 2·3-5cm. lata, coriacea, in utraque pagina obscura et glauca vel subglauca, omnino glabra, apice obtuso vel subacuto mucronato, margine integro, basi anguste rotundata vel subcuneata vel brevissime inequilateraliter cordata; costa media in utraque pagina prominens; nervi laterales in costae mediae utraque parte 7-10, excurvati et propter marginem anastomosantes; nervuli irregulares; petiolus crassus, glaber, 2-5mm. longus; stipulae scariosae, persistentes, 3mm. longae, glabrae, late ovatae, apice aculeato. Flores ♂ in glomerulis minute crebre bracteolatis axillaribus congregati, pedicellati; pedicelli graciles, teretes, glabri, 1-2mm. longi; sepala 6, bi-seriata, imbricata, glabra, exteriora ad. 4mm. longa, in dimidio basale anguste lanceolata, in dimidio apicale filiformia, interiora multo breviora; glandulae 6, sepalis alternantes, minutissimae, petaloideae, spathiformes; stamina 3, in columna centrale brevissima unita; antherae oppositae, trigone ovatae, vix ·3mm. longae, connectivis

productis et conniventibus. Flores ♀ imperfecte visi. quam masculinis majores; sepala 6 : ovarium globosum, hirsutum; stigmata 3, brevia.

Perak : Goping, *King's Collector* 4806!, 8219!. Pahang : Kotah Glanggi, *Ridley* 2056!, 2356!.

Distrib. Tonkin, (*Balansa*, 3290!).

Glochidion, Forst.

G. Kunstlerianum.

Frutex 2-3 m. altus. Rami subteretes, flavo-brunnei, glabri vel parce minute pubescentes, 2-3 mm. crassi, sine foliis sed foliorum squamas exhibentes ; internodia 1-·5 cm. longa ; ramuli alternantes, simplices, ex squamarum axillis solitarii, moderate graciles, angulati, flexuosi, leviter compressi, flavo-brunnei, plus minusve breviter crispe pubescentes ; internodia 1-2 cm. longa. Foliorum squamae minutae, triangulares ; lamina oblonge lanceolata, tenuiter coriacea, 4-9 cm. longa, 1·5-3 cm. lata, apice acuto vel breviter caudate acuminato, margine integro, basi anguste rotundata leviter inequilaterale ; pagina superior obscura vel subnitida, in costa media parce ferrugine pubescens vel glabrescens ; pagina inferior obscura, plus minusve ferrugine pubescens et capillorum delapsorum basibus asperiter punctata ; reticulatio obscura ; nervi laterales in costae mediae utraque parte 10-12, excurvati et propter marginem anastomosantes ; nervuli transversi, subparalleli ; petiolus subteres, plus minusve ferrugine pubescens, 2 mm. longus ; stipulae deciduae, minutae, triangulares, acutae, plus minusve ferrugine pubescentes. Flores in glomerulis axillaribus congregati ; in axillis singulis flores plerumque ♂ vel ♀ . Flores ♂ pedicellati, in nodulis axillaribus minutis bracteolatis dispositi ; bracteolae imbricatae, triangulares vix ·5 mm. longae, parce ciliolatae ; pedicelli subteretes vel subcompressi, 2-3 mm. longi, parce hirtelli ; calyx 1 mm. longus, fere ad basim 6-7-partitus ; sepala biserialia, exteriora late interiora anguste ovata, omnia extus parce hirsuta intus glabra ; stamina 3, antherarum connectivis breviter in coni forma productis. Flores ♀ in nodulis axillaribus sessiles ; bracteolae quam in ♂ ; calyx 1 mm. longus, fere ad basim 6-partitus ; sepala inaequalia, biserialia, extus plus minusve ferrugine pubescentia, intus glabra, exteriora lata ovata, interiora anguste vel late ovata ; ovarium subglobosum, 3-loculare, 1 mm. in diametro, inferne glabrum, superne ferrugine tomentosum ; styli 3, ·5mm. longi, crassi, conici, divergentes. Fructus infra calycem persistentem pedicellatus, pedicello 3 mm. longo, suborbicularis, 3-lobatus, 4 mm. altus, 7 mm. latus, tenuiter

pubescens, apice breviter depresso. Semina levia, triquetra, 3 mm. longa.

Perak: Ulu Kerling, *King's Collector* 8752!. Selangor: Kwala Lumpur, *Curtis* 2405!. Johor: Seram, *Ridley*, 11058!. Singapore: *Kurz*, *Anderson*!.

G. Maingayi. Species *G. goniocarpo* Hk. f. affinis sed stigmate sessile distincta.

Arbor vel frutex. Rami subteretes, obscure angulati, fusco-brunnei, glabri, 4-6 mm. crassi; internodia 5 cm. longa; ramuli 1-3 mm. crassi, 40 cm. longi vel longiores, compressi, brunnei, glabri; internodia 2·5-3·5 cm. longa. Foliorum squamae minutae, triangulares, glabri, lignescentes, stipulis paulo majoribus. Lamina magna, late oblonge ovata, coriacea, omnino glabra, 7-18 cm. longa, 3·5-7·5 cm. lata, apice breviter subcaudate acuminato apiculato, margine integro, basi leviter inaequilaterale rotundata vel subtruncata; nervi laterales in costae mediae utraque parte 10, excurvati et propter margiuem anastomosantes; nervuli perplurimi, transversi, subparalleli; petiolus subteres, glaber, vel breviter pubescens, 4 mm. longus; stipulae triangulares, acuminatae, glabrae, lignescentes, recurvatae, 3-4 mm. longae. Flores ♂ et ♀ in pedunculorum axillorum apicibus simul conferti; pedunculi 1 cm. longi, partim ad ramos adnati, crassiusculi, compressi, glabri, versus apices in ramulos bracteolatos brevissimos irregulariter divisi; bracteolae tetrastichae, ovatae, vel late triangulares, acutae, submembranaceae, glabrae vel parce setulosae, 1 mm. longae vel minores. Florum ♂ pedicelli teretes, rigidi, filiformes, parce setulosi, 6-8 mm. longi; calyx 1·5-2 mm. longus, fere ad basim subaequaliter 6-partitus; sepala obovata, 1 mm. lata, exteriora extus parce setulosa intus glabra, interiora omnino glabra; stamina 5, antheribus 1 mm. longis verticaliter oppositis, connectivis in umbonis forma productis. Florum ♀ pedicelli 3 mm. longi, teretes, glabri; calyx subhemispherice cupuliformis, 1-1·5 mm. longus, subregulariter triangulariter 5-dentatus, omnino glaber vel extus parce breviter setulosus; gynaecium subglobose spinuliforme vel subpyriforme, glabrum vel parce breviter setulosum, 1·5 mm. in diametro, apice obtuso vel subacuto obscure 5-fido, e calyce semi-exsertum. Capsula immatura, subglobosa, 3·5 mm. alta, 5 mm. lata, glabra, 4-locularis.

Malacca: *Maingay* (Kew Distrib. No.) 1357!. Singapore: Bukit Timah, *Ridley* 10846!.

G. singaporense. Species *G. Kunstleriano* affinis sed columna stylare distincta.

Arbor vel frutex. Rami flavo-brunnei, subteretes, sulcati, minuticulati

vel subscabridulosi, 2·5-3·5 mm. crassi; internodia 1·5-5·5 cm. longa. Ramuli ad 40 cm. longi, 1-2 mm. crassi, subteretes vel subcompressi, flavo-brunnei, obscure sulcati, hirti vel foliorum delapsorum basibus subscabridulosi; internodia 1-3 cm. longa. Foliorum squamae minutae, triangulares, lignescentes, glabræ vel parce hirtae. Lamina oblique oblonge ovata vel oblonge elliptica, 3·5-12 cm. longa, apice breviter subcaudate acuminato apiculato, margine integro, basi inaequilaterale subcuneata vel in costae mediae una parte rotundata altera parte subcuneata; pagina superior subnitida, in costae mediae parte basale parce hirta aliter glabra vel capillos perpaucos exhibens; pagina inferior obscura vel subnitida, minute irregulariter pustulata, in costa media nervis et nervulis parce hirtella; nervi laterales in costae mediae utraque parte 9, excurvati et propter marginem anastomosantes; nervuli perplurimi, transversi, subparalleli; petiolus subteres, 3 mm. longus, plus minusve hirtellus; stipulae subulatae, parce pubescentes, 2·5-3·5 mm. longae. Flores ♂ et ♀ in nodulis minutis bracteolatis axillaribus glomerulati, in axilla singula aut flores ♂ aut flores ♀ superantes; bracteolae ovatae vel triangulares, vix ·5 mm. longae, plus minusve ciliolatae. Flores ♂ pedicellati, pedicellis filiformibus, 5 mm. longis, paulo rigidis, parce hirtellis; calyx 2 mm. longus, fere ad basim 6-partitus; sepala biserialia, integra, exteriora oblonge ovata, subacuta, 1 mm. lata, margine lucido, extus parce setulosa intus glabra, interiora exterioribus similia sed paulo minora et extus minus setulosa vel glabra; antherae 3, oppositae, 1 mm. longae, connectivis in umbonis forma productis. Flores ♀ primo subsessiles; calyx 1·5 mm. longus, fere ad basim 6-partitus; sepala biserialia, integra, exteriora late lanceolata, ·5 mm. lata, extus hirtella intus glabra, interiora quam exterioribus paulo angustiora aliter similia; gynaecium obtuse subconicum, 1·5 mm. altum, 1 mm. latum, plus minusve hirsutum, 3-loculare, apice stylare 3-fido. Fructus pedicellatus, calyce persistente, pedicello 5 mm. longo, terete, plus minusve pubescente, subglobose depressus, 3 mm. altus, 5 mm. latus, velutino-pubescens, coccis rotundatis, apice plano vel leviter depresso, stigmate centrale minuto trifido. Semina oblique triquetria.

SUNGEI UJONG: specimen without number locality or collector's name.

MALACCA: specimen without number locality or collector's name.

SINGAPORE: without locality or collector's name but numbered 3087 !; Reservoir, *Ridley* 5044 !; Bojne, *Ridley* 5046 !; Palau Daman, *Ridley* 6751 !; Economic Garden, *Ridley* 12478 !; Garden Jungle, *Ridley* 13460 !.

G. tetrapteron. Species ramulis anguste tetrapteris satis distincta. Arbor vel frutex. Ramuli ad 40 cm. longi, 1-3 mm. crassi, brunnei, subteretes, minute crispe pubescentes, alis angustis distinctis 4 muniti; internodia 5-2 cm. longa. Lamina lanceolata, membranacea, 8-12 cm. longa, 2-3 cm. lata, apice acuminato apiculato, margine integro, basi leviter inaequilaterale rotundata vel late cuneata; pagina superior obscura, brunnea, parce breviter adpresse pubescens vel modo in costa media pubescens et aliter capillorum delapsorum basibus muriculata, costa media et nervis et reticulatione obscuris; pagina inferior obscura, in costa media nervis et nervulis prominentibus parce crispe pubescens; nervi laterales in costae mediae utraque parte 12, excurvati et propter marginem anastomosantes; nervuli plurimi, transversi, subparalleli; petiolus subteres, 1-2 mm. longus, pubescens; stipulae minutae, subulatae, pubescentes. Flores in nodulis minutis bracteolatis axillaribus glomerulati, in axilla singula plerumque aut flores ♂ aut flores ♀ superantes; bracteolae imbricatae, minutae, triangulares vel lanceolatae. Flores ♂ pedicellati, pedicellis gracilibus pubescentibus 2·5-3 mm. longis; calyx 1·5 mm. longus, ad basim 6-partitus; sepala subaequalia, oblonge ovata vel obovata, ·5 mm. lata, extus parce pubescentia, intus glabra; antherae 3, oppositae, vix 1 mm. longae, connectivis in coni angusti forma productis. Flores ♀ subsessiles; calyx 1 mm. longus, 6-dentatus, extus pubescens, intus glaber; ovarium suborbiculare, 1 mm. latum, 3-loculare, tomentosum vel pubescens; columna stylaris comparate magna, 2 mm. longa, crassa, clavata, plus minusve pubescens, apice breviter 3-fido. Fructus pedicellatus, calyce persistente pedicello 6-7 mm. longo gracile pubescente, orbicularis, 6-lobatus, plus minusve pubescens, 4 mm. altus, 9 mm. latus, 3-locularis, apice depresso columnam stylarem persistentem exhibente. Semina levia, oblique triquetria, 3·5 mm. longa, 3-3·5 mm. in diametro transverso.

SELANGOR; 15th mile, Pahang Track, *Ridley* 8522!.

Sauropus, B l.

S. Llanosi (Mull. Arg.). Comb nov. *Glochidion Llanosi* Mull. Arg. in Linn. XXXII, 68, (1863). *Phyllanthus Llanosi* Mull. Arg. in Flora, XLVIII, 387, (1865).

Drypetes, Vahl.

D. perakensis.—Species *D. Curtisii* affinis, sed lamina ovata et bis longa quam lata differt.

Frutex vel arbor parva. Ramuli obtuse angulosi vel subteretes, 2-5 mm. crassi, glabri, cinerei. Folia alterna, caduciter stipulata, breviter petiolata; lamina coriacea, ovata, 12-20 cm. longa, 5-8 cm. lata, omnino glabra, apice caudate acuminato, basi subcuneata, margine integro vel versus apicem brevissime obtuse serrato vel brevissime undulato; pagina superior nitida vel subnitida; pagina inferior obscura vel subnitida; costa media in utraque pagina prominens; nervi laterales in costæ mediae utraque parte 6-9, leviter excurvati et propter marginem anastomosantes; nervuli irregulares; reticulatio irregulariter polygonalis; petiolus paulo crassus, 1-2 c m. longus; stipulae haud visae. Flores ♂ in ramulis glomerulati; glomeruli parvi, 1-3 cm. distantes, multo floriferi, e basi minute bracteati; bracteae ovatae, obtusae vel triangulares, vix ·5mm. longae, minute sericeae; florum pedicelli teretes, versus calycem incrassati, minute sericei, 5 mm. longi; calyx in alabastro subglobosus, 3mm. in diametro, ad basim 4-partitus; sepala decussiter imbricata, integra, tenuiter carnosa, late ovata vel suborbicularia, minute sericea, exteriora 3-4mm. longa et lata, interiora paulum minora; discus quadratus vel breviter oblongus, glaber, planus, margine leviter elevato, in alabastro staminibus omnino occultus; stamina 20, in forma quadrata arcte compacta, brevissima, discum cingentia, filamentis semi-conjunctis; antherae oblongae ovatae, 4-locellatae, locellis parallelis, longitudinaliter birimosae. Flores ♀ in glomerulis iisdem atque florum ♂ dispositi, sed glomeruli pauci-floriferi; pedicelli crassi, 2 mm. longi, plus minusve minute sericei; calyx ovoideus, 3 mm. longus, ad basim 4-partitus; sepala decussiter imbricata, integra, submembranacea, late acuta, subaequalia, extus minute fulvo-pubescentia, intus glabra; discus subcupularis vel late annularis, membranaceus, in margine hirsutus, cetera glaber; ovarium 2-loculatum, ovoideum, biconvexum, glabrum, 2-5mm. longum, in medio utræque partis longitudinaliter sulcatum; loculi 2-ovulati, nitidi; stigmata 2, sessilia, transverse oblonga vel semi-lunata, simul discum formantia. Fructus bicocciformis, drupaceus, ovoideus, glaber, alte bilobatus, bicarinatus, 1·5 cm. longus et latus, 1 cm. crassus; pericarpium tenuissimum, coriaceum; endocarpium ad mesocarpium haerens, nitidum et intus cerebriforme sulcatum. Semina 2, endocarpio accomodata; albumen cerebriforme sulcatum et tegumento tenue obtectum; embryo in albuminis centro rectus; cotyledones ovatae, cordatae, plane oppositae.

PERAK: Larut, *King's Collector* 3967! 6650!; Gunong Bubu, *King's Collector* 7423!; Blanda Mabok, *Wray*, 3970!; without locality, *Wray* 3022!, 3025!.

Antidesma, Linn.

A. stenophyllum. Species *A. neurocarpo* Miq. affinis sed foliorum laminis quater longioribus quam latis et disco pentagonaliter conico distincta.

Frutex ad 3 m. altus. Ramuli teretes, 2-4 mm. crassi, glabri, pallide cinerei; internodia 1-3 cm. longa. Lamina anguste oblonge lanceolata, coriacea, 12-30 cm. longa, 3-7 cm. lata, apice caudate acuminato, margine integro, basi subcuneata; pagina superior glabra, subnitida, olivacea; pagina inferior subnitida, glabra vel in costa et nervis lateralibus parcissime et minute hirsuta; reticulatio in utraque pagina lucida; nervi laterales in costae utraque parte 14-18, regulares, leviter excurvati et propter marginem anastomosantes; nervuli irregulares; petiolus ·5-1 cm. longus, crassiusculus, glaber; stipulae foliaceae, submembranaceae, oblique ovatae, acutae vel acuminatae, integrae, inequilaterales, basi rotundata, ad 3 cm. longae, omnino glabrae vel in costa media in pagina inferiore parcissime hirsutae, e basi 5-6-nervosae. Flores ♂ in spicis axillaribus gracilibus simplicibus dispositi; spicae quam foliis breviores; spicae axis glaber, ad basim efloriferus sed plurimas bracteas parvas anguste lanceolatas gerens, supra interrupte 1-2 mm. distante floriferus; bracteolae ovatae acutae vel late lanceolatae, vix 1 mm. longae, glabrae vel parce hirsutae. Flores sessiles; calyx breviter cupuliformis, 1 mm. in diametro, 5-partitus; segmenta rotundata, glabra; stamina 5; discus conspicuus, carnosus, conico-pentagonalis, truncatus; pistillodium subglobosum, glabrum, unifoveolatum, in disci apice semi-immersum.

Inflorescentia feminea modo in fructu visa; racemus accrescens, ad 20 cm. longus, glaber; bracteolae haud aliter quam in spica masculina. Flores ♀ pedicellati; pedicelli 6 mm. longi, teretes, glabri; calyx masculino persimilis; discus annularis vel breviter cupuliformis, glaber, tenuiter carnosus; ovarium ovoideum, convexum, glabrum; stylus brevissimus, bifidus vel quadrifidus. Fructus ovoideus biconvexus, apice et marginibus subacutis, 1·2 cm. longus, 7 mm. latus, 4 mm. crassus, glaber; pericarpium extus crasse reticulatum; stigma terminale.

Perak: *Scortechini* 638 !; Larut, *King's Collector* 4249 !, 7880 !.

Johor: Gunong Pulai, *Ridley* !.

A. Kunstleri. Species *A. neurocarpo* Miq. et *A. stenophyllo* Gage affinis, sed calycis segmentis et staminibus 4 differt. Frutex ad 3 m. altus. Ramuli subteretes, versus apices plus vel minus ferrugine tomentosi, aliter parce puberuli vel glabrescentes, pallide cinerei; internodia 1·5-4 cm. longa. Lamina oblonge ovata vel oblonge lanceolata, tenuiter coriacea, 8-24 cm. longa, 3-9 cm. lata, apice caudate

acuminato breviter mucronato, margine integro, basi subcuneata; pagina superior subnitida, glabra, costa media et nervis tenuibus; pagina inferior obscura, in costa media et nervis prominentibus plus vel minus parce pubescens, aliter glabra vel parcissime et minutissime adpresse hirsuta; nervi laterales in costae mediae utraque parte 11-13, leviter excurvati et propter marginem anastomosantes; nervuli irregulares; reticulatio lucida, mediocriter aperta; petiolus 8 mm. ad 2·5 cm. longus, crassiusculus, plus vel minus ferrugine tomentosus vel glabrescens; stipulae foliaceae, oblique ovatae vel late lanceolatae, 1-3 cm. longae, 3 mm. ad 1·5 cm latae, inequilaterales, in pagina superiore glabrae, in pagina inferiore glabrae vel parce minute adpresse hirsutae. Inflorescentiae ♂ et ♀ spicae simplices vel (et) paniculae parce et spiciforme ramosae, axillares vel (et) ramulos terminantes; spicarum vel panicularum ramuli in flore raro laminae longitudinis dimidium excedentes; in fructu spicae ♀ accrescentes et quam laminae longae. Spicae ♂ graciles, plus vel minus ferrugine tomentosae, bracteolis late ovatis, vix 1mm. longis, in pagina exteriore plus vel minus ferrugine hirsutis, in pagina interiore glabris. Flores ♂ sessiles, breviter cupuliformes, subquadrigone rotati, 1 mm. in diametro, fere ad basim quadripartiti; calycis segmenta late ovata, extus parce adpresse hirsuta, intus glabra vel prope basim parce hirsuta; disci annularis segmenta 4, glabra vel parce setulose hirsuta; stamina 4, erecta; pistillodium minutum, subclavatum, parce minute puberulum. Racemi ♀ plus vel minus tomentosi vel puberuli; bracteolae quam in racemo masculino. Florum ♀ pedicelli vix 1 mm. longi, crassiusculi, pubescentes vel tomentosi; calyx cupuliformis, fere ad basim quadripartitus; segmenta late ovata, extus plus vel minus tomentosa, intus ad basim subcrasse barbata; discus annularis, tenuiter carnosus, glaber vel extus calycis pilis adhaerentibus pseudo-hirsutus; ovarium oblonge ovoideum, sub-compressum, biconvexum, 1 mm. longum, glabrum vel setulas perpaucas gerens; stigma sessile, comparate magnum, breviter 4-5-radiatum. Drupae pedicellus 2 mm. longus, parce puberulus vel glaber; drupa ovoidea, compressa, biconvexa, 9 mm. longa, 7mm. lata, 5 mm. crassa; pericarpium crasse et depresse reticulat um; stigma terminale.

PERAK: *Scortechini* 629 !; Larut, *King's Collector* 2645 !, 2927 !, 3219 !, 5012 !; Maxwell's H.ll, *Ridley* 2975 !; Gunong Inas, *Wray* 4077!

A. cruciforme. Species *A. pendulo* Hk. f. affinis sed foliorum laminis quater longioribus quam latis et inflorescentiae axe breviore et rufo tomentoso differt.

Arbor parva. Ramuli subteretes, 2-3 mm. crassi, primo rufo tomen-

tosi deinde glabrescentes; internodia 2-4cm. longa. Lamina anguste oblonga vel oblonge lanceolata, coriacea, 16-27cm. longa, 4-7cm. lata, apice caudate acuminato, margine integro, basi subcuneata vel rotundata; pagina superior glabra, subnitida, costa media et nervis et reticulatione lucidis et tenuibus; pagina inferior parce et breviter hirsuta praesertim in costa media et nervis lateralibus, reticulatione leviter obscura; nervi laterales in costae mediae utraque parte 14-18, leviter excurvati et propter marginem anastomosantes; petiolus 1-2cm. longus, crassus, rufe tomentosus vel glabrescens; stipulae lanceolatae, subulatae, ad 2cm. longae in paginis duobus rufe tomentosae, deciduae. Inflorescentiae ♂ et ♀ spicae simplices in axillis solitariae, quam foliorum laminis ter vel quater breviores. Spicae ♂ axis gracilis, rufe tomentosus; bracteolae anguste lanceolatae, 1mm. longae, extus plus vel minus rufe tomentosae, intus glabrae. Flores ♂ sessiles; calyx obtuse quadrigone ovoideus acutus in alabastro, vix 1mm. longus, fere ad basim quadripartitus et in aperto cruciformis; segmenta aequalia, anguste lanceolata, extus et in margine parce setulosa, intus glabra; stamina 4; discus orbicularis pulvinatus, glaber. Flores ♀ brevissime pedicellati, pedicellis glabris vel parcissime et minutissime pubescentibus; calyx eodem maris persimilis; discus in fructu annularis, glaber, crassiusculus; fructus oblique ovoideus, glaber, 8mm. longus, 6mm. latus, 4mm. crassus; pericarpium crasse impresse et irregulariter reticulatum; stigma terminale, minutum, glabrum, obscure quadrifidum.

PERAK: Gunong Batu Pateh, *Wray* 9121, 11831.

A. gracillimum. Species *A. delicatulo* Hutchinson in Plant. Wilson. II, Pt. III, p. 522, (1916) affinis, sed spicis axillaribus, floribus sessilibus et disco tenue et quadrifide annulare distincta.

Arbor parva. Ramuli teretes, 1-mm. crassi, glabri, pallide cinerei; internodia ·5-2cm. longa. Lamina lanceolata, tenuiter coriacea, 3·5-9cm. longa, 1·5-3·5cm. lata, apice breviter et obtuse acuminato mucronato, margine integro, basi rotundata vel subcuneata; pagina superior pallide olivacea, glabra, subnitida; pagina inferior obscura, pallide brunnea, glabra, saepe minute punctata; costa media et reticulatio utrimque graciles et lucidae; nervi laterales in costae mediae utraque parte 8, leviter excurvati et propter marginem anastamosantes; nervuli irregulares; petiolus 3-7mm. longus, crassiusculus, glaber vel parcissime hirsutus; stipulae deciduae, lanceolate, subulatae, 4-5mm. longae, extus glabrae, intus parce pubescentes. Inflorescentiae ♂ et ♀ spicae parvulae, delicatulae, teretes, ad 1·5cm. longae, plus vel minus puberulae, in tuberculis axillaribus 2-5-congregatae; bracteolae late ovatae vel triangulares,

vix ·5mm. longae, in pagina superiore glabrae, in inferiore plus vel minus pubescentes. Flores ♂ sessiles; calyx brevissime cupuliformis, vix 1mm. in diametro, 4-5-partitus; segmenta late ovata, subaequalia, extus parce pubescentia, intus glabra; stamina 4-5; discus annularis, tenuiter carnosus, quadrifidus; pistillodium conspicuum, subclavatum, glabrum vel parce et minute setulosum. Spicae in fructu ad 4cm. vel plus accrescentes. Flores ♀ subsessiles; calyx vix 1mm. longus, cupuliformis, 4-5-partitus; segmenta late lanceolata, extus parce pubescentia, intus ad basim leviter barbata; discus annularis, tenuiter carnosus, glaber; ovarium parum oblique ovoideum glabrum; stigma sessile, terminale, minutum, obscure 4-5-radiatum. Fructus immaturus brevissime pedicellatus, oblique ovoideus, biconvexus, glaber, 5mm. longus. PERAK: without locality, *Wray* 3237!; Maxwell's Hill, *Wray* 2946!; Gunong Inas, *Wray* 4064?

Aporosa, Bl.

A. Prainiana King Mss. in Herb. Calcutt.

Arbor 6-20m. alta. Ramuli teretes, glabri, fusco brunnei, 1-5mm. crassi; internodia 2-4cm. longa. Lamina ovata vel late lanceolata, coriacea, 10-20cm. longa, apice acuminato, margine integro, base cuneata vel subcuneata; pagina superior glabra, obscura, subglaucescens, sub lente glandulis minutis crebre punctata, reticulatione paulo obscura; pagina inferior quam superiore obscuriora, glabra, haud punctata; nervi laterales costae mediae utraque parte 5-6, leviter excurvati et propter marginem anastomosantes; reticulatio polygonalis; petiolus 1-1·7cm. longus, semiteres, glaber, aliquid tenuis; stipulae non visae. Spicae ♂ in axillis 3-8 congregatae, graciles, glabrae, ad 4cm. longae, bracteas 2-4mm. distantes gerentes; bracteae late et obtuse ovatae, glabrae, membranaceae, 1 mm. longae et latae. Flores ♂ in bractearum axillis 8 vel plus quam 8 glomerulati, sessiles; calycis segmenta 4, membranacea, glabra, late oblanceolata vel subspathulata, vix 1mm. longa; stamina 2-3, quam calyce breviora; pistillodium minutum, raro magnum. Inflorescentiae ♀ racemi graciles, glabri vel glabrescentes, ad 3cm. longi, in foliorum axillis solitarii vel 2-3-congregati. Flores ♀ secundum axim singulatim dispositi, 1-3mm. distantes, basaliter 3-bracteat ebrevissime pedicellati; sepala 5, subaequalia, acute ovata vel triangularia, vix 5mm. longa, membranacea; ovarium ovoideum, glabrum, 2mm. longum; stigmata 3, sessilia, minuta, obscure

bifida. Fructus subtrigone ovoideus, glaber, flavescens, 1·6cm. longus, 1·3cm. latus, asper, stigmatibus minutis sessilibus coronatus, triloculari, uno loculo saepe obsoleto ; mesocarpium 1mm. crassum, carnosum ; endocarpium crustaceum, intus glabrum et fibrose rugulosum Semen leve, plano-convexum, 1cm. longum, 7mm. latum.

Penang : Government Hill, *Curtis* 1476 ! (Type sheet), 1477 !. Found also in Perak, Selangor, Malacca, Johor and Singapore and in Sumatra.

A. symplocoides (Hk. f.) Gage (comb. nov.) . *Baccaurea? symplocoides* Hk. f. in Fl. Brit. Ind. V, 376.

I refer these two species *A. Prainiana* and *A. symplocoides* to *Aporosa* rather than to *Baccaurea*, as they agree better with the former in the clustering of the sessile male flowers, the stamens and in the perianth of both sexes. Although very distinct from all the other species of either *Aporosa* or *Baccaurea*, the distinction is scarcely a generic difference.

A. confusa. Species *A. frutescenti* Bl. affinis, sed laminis majoribus, nervis lateralibus paucioribus et fructibus minoribus differt.

Frutex vel arbor. Ramuli teretes, plus vel minus fusce pubescentes vel glabri ; internodia 1·5-4·5cm. longa. Laminae ellipticae vel oblonge lanceolatae, membranaceae, 14-25cm. longae, 4-7·5cm latae, apice caudate acuminato, margine integro, basi subcuneata vel rotundata ; pagina superior obscura, glabra ; pagina inferior quam superiore obscuriora, in costa media et nervis parce hirsuta, reticulatione distincta ; nervi laterales in costae mediae utraque parte 10-12, excurvati et propter marginem anastomosantes ; petiolus crassus, 1cm. longus, plus vel minus pubescens ; stipulae late falcatae, inequilaterales, 8mm. longae, in pagina superiore glabrae, in inferiore plus vel minus hirsutae. Spicae ♂ ad descriptionem haud satis maturae. Spicae ♀ in axillis 2-4-congregatae, ad 6mm. longae, fulvo tomentosae ; bracteae approximatae, triangulares, extus plus vel minus fulvo tomentosae, intus glabrae, 5mm. longae et latae. Florum ♀ pedicelli 3mm. longi, crassiusculi, plus vel minus fulvo tomentosi ; calycis segmenta 5-6, triangulares, vix 1mm. longa, extus plus vel minus fulvo pubescentia, intus glabra ; ovarium triloculare, plus vel minus adpresse fulvo pubescens ; stigmata 3, sessilia, in discum compactum et breviter infundibuliforme connata. Fructus subtrigone globosus, pedicello crasso 8mm. longo, parce adpresse pubescens vel glabrescens, in vivo clare flavus, in sicco brunneus, per suturas omnes dehiscens, 2·1cm. longus, 1·9cm. latus, superficie leviter aspera ; mesocarpium 3-4mm. crassum ; endocarpium tenuiter crustaceum, triloculare sed raro semina 3 continens ; semina scarabaeoidea, 1·2cm. longa, 7mm. lata, 4mm. crassa.

PERAK : Goping Trinta, *King's Collector* 4539 ! ; Chanderiang, *Kunstler* 5742 !; Ulu Bubong, *King's Collector* 10,383 ! 10,997 !
PAHANG : *Machado* 11,554 ! . SINGAPORE : Garden jungle, *Ridley* 6301 ! ; Bukit Timah, *Ridley* 6486 ! ; Bukit Mandai, *Ridley* 6490 !
DISTRIB.—Sumatra, *Forbes* ! 3684 !

Baccaurea, Lour.

B. Kunstleri King Mss. in Herb. Calcutt. Species *B. polyneurae* Hk. f. affinis, sed laminis majoribus differt.

Arbor ad 20m. alta. Ramuli teretes, 3-7mm. crassi, primo ferrugine tomentosi, mox glabrescentes, cicatricibus foliorum prominentibus; internodia 5-1cm. longa. Lamina ovata, acuta, valide coriacea, 9-20cm. longa, 5-11cm. lata, apice acuto, margine integro vel subundulato, basi cordata vel subcordata; pagina superior obscura vel subnitida, costa media et nervis tenuibus impressis, primo in costa media et nervis ferrugine tementosa, aliter minute et parce substellate hirsuta, mox glabrescens vel glabra, reticulatione densa; pagina inferior obscura, crassiuscule villosa, costa media et nervis prominentibus ; nervi laterales in costae mediae utraque parte 9-12, regulares, leviter excurvati et propter marginem anastomosantes ; nervuli subparalleli, lucidi, 2-5mm. distantes ; petiolus crassiusculus, subteres, ad 6cm. longus, primo dense ferrugine tomentosus, dein glabrescens ; stipulae integrae, lanceolatae, subulatae, 6-8mm. longae, plus vel minus ferrugine pubescentes. Flores ♂ in paniculis axillaribus dispositi ; paniculae in foliorum vel cicatricum axillis 2-6-congregatae, tenues, ad 4 cm. longae, racemiformes, dense ferrugine pubescentes, in dimidio basali efloriferae sed bracteas minutas distantes gerentes, in dimidio apicale in ramulos floriferos crebros brevissimos subaequales subteretes ferrugine tomentillosos divisae ; ramuli singuli, 3-bracteati, apice florifero ; bracteae lanceolatae ; bractea centralis quam lateralibus majora et in ramuli longitudine tota adnata, apice expanso et libero, 1mm. longa, extus plus vel minus ferrugine tomentillosa, intus glabra. Flores sessiles, in bractearum axillis singuli, in alabastro depresse-subglobosi, 1mm. in diametro, fere ad basim 4-partiti ; segmenta ovata, integra, tenuiter carnosa, extus ferrugine tomentillosa, intus parce pubescentia vel glabrescentia ; stamina 5-6 ; pistillodium minutissimum, breviter subclavatum, tomentosum. Inflorescentia ♀ paniculae racemiformes, iis plantae ♂ similes, sed validiores et longiores, in fructu multo accrescentes ad 20cm. longae, in foliorum axillis solitariae vel 2-5-congregatae vel statim ex ramulis existentes ; paniculae in

dimidio basali efloriferae sed bracteas plurimas stipuliformes distantes gerentes, in dimidio apicali in ramulos breves crebros subaequales 2-2·5mm. longos ferrugine tomentillosos divisae; ramuli subcompressi, ad apicem expansi, 3-bracteati, floriferi; bracteae late lanceolatae vel ovatae; bractea centralis quam lateralibus majora, in ramuli apice plus vel minus adnata, 1·5mm. longa, ferrugine tomentillosa. Flores ♀ in bractearum axillis singuli; flos centralis quam lateralibus major et plerumque solus fructiferus; nonnunquam ramuli vere dichotomi. Calyx in alabastro subglobosus, 2mm. in diametro, 5-6-partitus; segmenta oblonge ovata, integra, carnosa, in pagina utraque tomentillosa; discus O; ovarium ovoideum, 1mm. longum, ferrugine tomentosum, plerumque 3-loculare; loculi intus adpresse tomentosi; stigma sessile, 3-fidum, parce papillose fimbriatum. Fructus brevissime pedicellatus, plerumque trigone ovoideus, acutus, basi leviter concava, tenuiter ferrugine pubescens, 1·6cm. longus, 1·8cm. crassus, pedicello 2mm. longo, terete, ferrugine tomentoso; pericarpium 1mm. crassum, crustaceum, intus plus vel minus adpresse tomentosum. Semina 2-3, plane scarabaeoidea, 8mm. longa, 7mm. lata, 3mm. crassa, levia.

PERAK: *King's Collector* 8139!. SINGAPORE: *Ridley* 2803!; Botanic Garden jungle, *Ridley* 4938!, 6261!, 6670!; Tanjing Gol, *Goodenough* 5084!; Seletar, *Ridley* 6163!.

B. Kingii. Species *B. minori* Hk. f. affinis sed nervulis irregularibus et fructu quadrigone obovoideo differt.

Arbor 7-20m. alta. Ramuli teretes, 1-4mm. crassi, primo parcissime et minutissime pubescentes, deinde glabri, glaucescentes; internodia 2mm. ad 2cm. longa. Folia saepe versus ramulorum apices approximata; lamina elliptice ovata, membranacea, 5-17cm. longa, 2-6·5cm. lata, apice breviter caudate acuminato, margine integro, basi cuneata vel subcuneata vel raro truncate rotundata; pagina superior obscura, glabra, costa media et nervis tenuibus; pagina inferior obscura, glabra, costa media et nervis prominentibus; nervi laterales in costae mediae utraque parte 7-9, excurvati et propter marginem anastomosantes; nervuli irregulares; petiolus tenuis, subteres, glaber, 1-4·5cm. longus; stipulae lanceolatae, integrae, 2mm. longae, in pagina superiore glabrae, in inferiore plus vel minus pubescentes.

Inflorescentiae ♂ paniculae tenues, racemiformes, ad 5 cm. longae, minute papillose tomentillosae, in foliorum et cicatricum axillis singulae vel 2-3-congregatae; in axis dimidio basali efloriferae et bracteas paucas distantes gerentes, in dimidio apicali ramulos plurimos subaequales 2mm. longos, 1-2mm. distantes compressos 1-bracteatos 3-floriferos gerentes;

bractea per ramuli longitudinem totam adnata et ultra ramuli apicem subcucullate expansa. Flores ♂ sessiles, in ramuli apice congregati; calyx 1mm. in diametro, fere ad basim 4-5-partitus; segmenta ovata, integra, tenuiter carnosa, in utraque pagina fulve tomentillosa; stamina 4-5; pistillodium crasse cylindratum vel subclavatum, plus minusve tomentosum. Inflorescentia feminea masculinae similis sed minus tenuior et in fructu leviter accrescens; ramuli et bracteae masculinis similes sed ramuli 1-floriferi. Calyx 3mm. in diametro in aperto, fere ad basim 4-partitus; segmenta ovata, tenuiter carnosa, in utraque pagina tomentillosa; discus 0; ovarium globosum, 1-5mm. in diametro, parce adpresse hirsutum, biloculare; stigma sessile, bicornute bifidum, parce papillose fimbriatum. Fructus obtuse quadrigone obovoideus, 8-9mm. longus, 7mm. crassus, parce minute adpresse hirsutus, mox glabrescens, leviter scaberulus; pericarpium vix ·5mm. crassum, crustaceum, intus glabrum, suturis 4 dehiscens. Semina 1-2, plane scarabaeoidea, levia, 6mm. longa, 2·5mm. crassa, in dorso leviter carinata. *Baccaurea Sp. A.* Hk. f. Fl. Brit. Ind. V, 373; *Aporosa Wrayi* King Mss. in Herb. Calcutt.

PERAK: Tapa, *Wray* 1364!; Larut, *King's Collector* 3729!, 6762!, 6829!; Goping, *King's Collector* 8174!, 8176!; Gunong Bata, *King's Collector* 8049!. SINGAPORE: Bajan, *Ridley* 6260!; Seletar, *Ridley* 6368!; Bukit Timah, *Ridley* 6495!, 6495A!, 8286!.

King had named this species *Aporosa Wrayi* on some of the sheets in the Calcutta Herbarium. The species is however a *Baccaurea* and as the name *B. Wrayi* had been applied by Hooker to another species of that genus King's name has to be set aside.

B. Hookeri. Species *B. bracteatae* affinis sed laminae pagina inferiore epunctata et sine capillis caespitosis differt.

Arbor ad 20m. alta. Ramuli 3-6mm. crassi, teretes, primo parce et minute pubescentes, mox glabri; internodia ·5-1·5cm. longa. Lamina coriacea, ovata, 8·5-20cm. longa, 4-10c.m. lata, apice subacuto, basi rotundata, margine integro et glandulis distantibus minute hirsutis instructo; pagina superior obscura vel subnitida, glabra vel in costa media parce tomentosa, nonnunquam sub lente minute punctata, costa media et nervis tenuibus; pagina inferior obscura, in costa media et nervis prominentibus parce minute substellate villosa vel glabrescens, reticulatione lucida; nervi laterales 9-11 in costae mediae utraque parte, excurvati et propter marginem anastomosantes; nervuli subparalleli, 2-4mm. distantes; petiolus ad 6cm. longus, parce pubescens vel glaber; stipulae non visae. Flores ♂ et ♀ non visi. Infructescentiae paniculae racemiformes, tenues, ad 30cm. longae, in ramulis singulae vel congregatae; axis crassiusculus, angulatus, fulve puberulus, in dimidio apicale

ramulos multos subaequales 4mm. longos 1-8mm. distantes recurvatos leviter compressos rufe tomentillosos 3-bracteatos vel 1-bracteatos 1-floriferos gerentes; bractea centralis adnata, ultra ramuli apicem triangulariter producta, in pagina utraque tomentillosa. Fructus pedicellus in ramuli apice articulatus, 4mm. longus, tomentillosus; calyx in fructu fere ad basim 4-5-partitus, segmentis oblonge ovatis integris, tenuiter carnosis, 3mm. longis, tomentillosis; fructus ovoideus, 3-locularis, 1·3-1·5cm. longus, minute puberulus vel glabrescens; pericarpium tenuiter crustaceum, intus fibrose rugulosum, glabrum vel in septis parce substellate setulosum: stigma sessile, minutum, trifidum. Semina 3, plane scarabaeoidea, 7-8mm. longa, 6mm. lata. *B. sp. E.* Hook. f. Fl. Brit. Ind. V. 375.

PERAK: *King's Collector* 6240!, 6860!. SINGAPORE: Bukit Mandai, *Ridley* 6668!, Chu Chu Kang, *Ridley* 6745!.

Although in the Flora of British India Hooker quotes the sheets King's Collector, Nos. 6240 and 6860 as the types of his species E, these very sheets in Kew Herbarium are named by Hooker himself species B. In the Flora King's Collector No. 3266 is quoted as the type of species B, whereas in Kew Herbarium this same sheet is named by Hooker himself *B. Griffithii*, which it seems to me to be. King's Collector No. 7368, which in the Flora is quoted as the type of species C is merely a male specimen of *B. Griffithii*.

B. pyriformis. Species *B. reticulatae* et *B. sapidae* affinis, sed petiolo quam laminae dimidio minore et laminae apice subacuminato differt.

Arbor. Ramuli teretes, 3-5mm. crassi, minute fulve puvescentes, foliorum cicatricibus prominentibus; internodia ·5-2·5cm. longa. Lamina elliptice ovata vel obovata, tenuiter coriacea, 4-16cm. longa, 2-9cm. lata, apice acuto vel brevissime subacuminato, margine brevissime undulato, basi subcuneata; pagina superior nitida vel subnitida, glabra, costa media et nervis impressis, recticulatione obscura; pagina inferior obscura, in costa media et nervis prominentibus parce substellate hirsuta vel omnino glabra, reticulatione lucida; nervi laterales in costae mediae utraque parte 6-8, excurvati et propter marginem anastomosantes; nervuli subparalleli, 2-6mm. distantes; petiolus crassiusculus, subteres, ad 3·5cm. longus, primo plus minusve minute fulve pubescens, dein de glaber; stipulae anguste lanceolatae, integrae, ad 7mm. longae, subtus fulve tomentosae, supra glabrescentes. Inflorescentiae masculinae paniculae racemiformes, graciles, ferrugine-tomentillosae, ad 6cm. longae, in foliorum vel cicatricum axillis singulae vel 2-4-congregatae; axis in dimidio basali efloriferus sed bracteas stipuliformes distantes gerens, in dimidio apicale ramulos floriferos, 1mm. distantes, subaequales, 2mm. longos, crassiusculos, compressos, tomentillosos, ad

apicem 1-bracteatos exhibens; bractea apicalis adnata, lanceolata, tenuiter carnosa, integra, 2mm. longa, infra tomentillosa. Flores ♀ infra bractea arcte 8-12-congregati, subsessiles, minuti, ebracteolati; calyx depressus, subglobosus, 1mm. in diametro, fere ad basim 4-partitus; sepala ovata, integra, in utraque pagina tomentillosa; stamina 4; pistillodium subcylindratum, tomentillosum. Inflorescentia feminea masculinae similis sed paniculae paulo validiores et ramuli ad apicem 1-floriferi. Flores sessiles; calyx fere ad basim 4-5-partitus; sepala subaequalia, ovata, integra, tenuiter carnosa, vix 2mm. longa, in utraque pagina tomentillosa; ovarium obtuse trigone ovoideum, dense tomentillosum, 3-loculare, intus glabrum; stigma sessile, 3-lobatum, parce papillose fimbriatum. Infructescentiae paniculae accrescentes, ad 10-11cm. longae; fructus drupace-capsularis, in ramuli apice sessilis, obtuse subtrigone obovoideus vel pyriformis, 2·5cm. longus, 2cm. latus, 3-locularis, leviter rugosus, parcissime et minute pubescens vel glaber, lineas suturales 6 leviter exhibens; pericarpium 2mm. crassum, intus glabrum, rugulosum. Semina in capsula 3, plane scarabaeoidea, 1·4cm. longa, 9mm. lata, 3mm. crassa.

B. spp. F. and G. Hooker f. Fl. Brit. Ind. V, 375, 376.

PENANG: Pantie Achie, *Curtis* 3065 !. MALACCA: *Griffith* 4901!, *Maingay* 1361!; Merliman, *Derry* 66!; *V. M. A.* 1845!; Ayer Panas, *Goodenough* 1895!, 1992!. SINGAPORE: Singapore Botanic Garden sheets without locality or collectors name, 28!, 188!, 2766!, 2949!, 2950!; Chu Chu Kan, *Ridley* 6104!, 6162!; Krangi, *Ridley* 6491!; Rogie, *Ridley* 6492!; Botanic Garden jungle, *Ridley* 6669!; without locality, 6746!.

I can detect no difference between Hooker's species F and his species G.

Galearia, Zoll. & Mor.

G. minor. Species racemis brevibus satis distincta. Arbor parva. Ramuli 1-3mm. crassi, angulati et suleati, parce ferrugine pubescentes; internodia 1-3cm. longa. Lamina membranacea vel tenuiter coriacea, ovata, 5·5-13cm. longa, 2-5·5cm. lata, apice breviter acuminato, margine integro, basi cuneata vel subcuneata; pagina superior obscura vel subnitida, glabra vel in costa media et nervis parce et minute ferrugine pubescens, reticulatione lucida; pagina inferior superiori similis sed costa media et nervi prominentes; nervi laterales in costae mediae utraque parte 6-7, excurvati et propter marginem anastomosantes; nervuli irregulares; reticulatio gracilis, irregulariter polygonalis; petiolus 2-4mm. longus, crassiusculus, plus minusve ferrugine pubescens;

stipulae subulatae, 2mm. longae, plus minusve ferrugine puberulae. Inflorescentiae masculinae racemi gracillimi, 10-30cm. longi, ex ramulorum lateralum apicibus et axillis penduliter arcuati, parce ferrugine pubescentes, minute bracteati et florum fasciculos perplurimos gerentes; bracteae 1-3mm. distantes, lanceolatae, 2mm. longae, extus ferrugine hirsutae, intus glabrae. Flores in bractearum axillis 3-congregati, pedicellati et ad nodulos minutos bracteolatos articulati; pedicelli 2mm. longi, teretes, puberuli, crassiusculi; calyx 5-radiate asteriformis, 1·5mm. in diametro, extus pubescens, intus glaber; sepala intus in medio longitudinaliter cristata; corolla in alabastro subglobosa, depressa, 5-lobulata, fere 2mm. in diametro; petala 5, late ovata, profunde concava, 1·5mm. longa, omnino glabra, intus in medio longitudinaliter cristata, marginibus inflectis et valvatis, apice plus minusve cucullate et minute barbato; stamina 10, erecta; filamenta glabra, crassiuscula; antherae glabrae, basifixae; pistillodium crassum, subclavatum, tomentosum. Inflorescentia feminea et infructescentia non visae.

Perak: G. Merah, *King's Collector* 902 !; Goping, *King's Collector* 4322 !.

Pahang: Palau Jellum, *Ridley* !. Sungei Ujong, no collector's name, 2297 !.

Distrib. Sumatra (*Forbes* 3096 !)

G. Ridleyi. Species *G. Wallichii* affinis, sed floribus ♀ in bractearum axillis singulis distincta.

Frutex vel arbor. Ramuli graciles, anfractuosi, 1-1·5mm. crassi, angulati, glabri vel minutissime et parce puberuli; internodia 1·5-6cm. longa. Lamina tenuiter coriacea, oblonge ovata, 5·5-14cm. longa, 1·7-5cm. lata, apice acute vel subcaudate acuminato, margine integro, basi acuta; pagina superior subnitida, glabra vel in costa media minutissime et parce puberula, costa media et nervis tenuibus; pagina inferior obscura, glabra, costa media et nervis prominentibus; reticulatio in utraque pagina lucida; nervi laterales in costae mediae utraque parte 7-8, excurvati et propter marginem anastomosantes; nervuli irregulares; petiolus gracilis, 3mm. longus, glaber vel minutissime puberulus; stipulae non visae. Inflorescentiae masculinae racemi gracillimi, minute bracteati, parce minute puberuli vel glabri, ad 20cm. longi, ramulos terminantes; bracteae 1-2mm. distantes, anguste lanceolatae, 1mm. longae, glabrae vel glabrescentes; flores pedicellati, in bractearum axillis 6-congregati et in ramulis minutis noduliformibus bracteolatis articulati; pedicelli graciles, subteretes, 2mm. longi, minute puberuli;

calyx vix cupuliformis, 1·5mm. in diametro, subaequaliter 5-dentatus, dentibus triangularibus, extus puberulus, intus glaber; petala 5, oblonge ovata, tenuiter carnosa, 1mm. longa, leviter concava, apice subcucullato, glabra, intus longitudinaliter cristata; stamina 10, biseriata, exteriora parum longiora et sepalis opposita; filamenta glabra; antherae didymae, basifixae, loculis ovoideis glabris; pistillodium crassum, subclavatum, tomentosum. Inflorescentia feminea masculinae similis sed bracteae 1-floriferae. Pedicellus vix ·5mm. longus, crassus, puberulus, in nodulo minuto 2-bracteolato articulatus; calyx fere planus, 1mm. in diametro, 5-radiate asteriformis, fere ad basim 5-partitus; sepala subaequalia lanceolata, extus pubescentia, intus in crista centrale parce adpresse hirsuta; petala haud visa; ovarium subglobose ovoideum, vix 1mm. in diametro, dense fulve tomentosum, breviter sulcatum, 2-3-loculatum, loculis 1-ovulatis; stigmata 2-3, sessilia, alte bifida, ramulis filiformibus leviter recurvatis. Fructus drupaceus, pedicello 2mm. longo, transverse oblonge ovoideus, concavo-convexus, 1cm. latus, 7mm. altus, 4mm. crassus, in margine breviter sulcatus, parce minutissime puberulus.

Selangor: Dusum Tua, *Ridley*!. Johor: Gunong Janeng and Simpai, *Lake* and *Kelsall*!.

Croton, L.

C. lucidum. Species *C. Wallichii* affinis sed laminae pagina superiore nitida distincta.

Frutex vel arbor? Ramuli graciles, teretes, 1-3mm. crassi, cinerei. Lamina coriacea, elliptice ovata vel lanceolata, 4-10cm. longa, 2-4cm. lata, apice breviter caudate acuminato, basi subcuneata, margine integro vel brevissime undulato minute distanter glanduloso; pagina superior glabra, nitida vel subnitida, costa media et nervis tenuibus; pagina inferior obscura, subglauca, parce minutissimis squamis rufis asteriformibus induta, costa media et nervis prominentibus; reticulatio in utraque pagina obscura; nervi laterales in costae mediae utraque parte 6-8, excurvati et propter marginem anastomosantes; nervuli irregulares; petiolus tenuis, glaber vel primo squamis paucis minutis indutus, eglandulosus; stipulae haud visae. Inflorescentiae racemi graciles, 4cm. longi, ramulos terminantes; axis subteres, glaber vel minute parce stellate lepidotus; flores pedicellati, in axe singulatim dispositi, basaliter 3-bracteati, feminei pauci apud basim masculini plurimi; bracteae lanceolatae, integrae, membranaceae, centralis 1mm. longa, laterales multo breviores, extus

parce lepidotae, intus glabrae vel versus apicem barbatae. Florum ♂ pedicelli 3mm. longi, teretes, plus minusve rufe lepidoti; calyx subglobosus, 2mm. in diametro, 5-partitus; sepala subaequalia, late lanceolata, membranacea, integra, leviter imbricata, 2·5mm. longa, extus parce rufe lepidota, intus versus apicem barbata, aliter glabra; petala 5, anguste oblonga vel subspathulata, tenuiter membranacea, integra, disci lobulis alternantia, margine versus apicem lanato; discus annularis, 5-lobulatus, tenuiter carnosus, calycis basim vestiens; stamina 11, 2-serialia, uno centrale; filamenta glabra, basibus disci superficie dense lanosa occultis; antherae late ovoideae, primo arcte inflectae, basifixae. Florum ♀ pedicelli crassiusculi, 3mm. longi, parce stellate rufo-lepidoti; calyx suburceolatus, 2·5mm. longus, fere ad basim 5-partitus; sepala subaequalia, oblonge ovata, vel late lanceolata, integra, tenuiter carnosa, extus parce stellate rufe-lepidota, intus versus apicem barbata, aliter glabra; discus annularis, calycis basim vestiens, tenuiter carnosus, 5-lobulatus, lobulis transverse ovatis, sepalis oppositis; petala minutissima, squamiformia, ovoidea, carnosa, flave pellucida; ovarium obtuse trigone ovoideum, 1·5mm. in diametro, dense stellate rufo-lepidotum, 3-loculare, intus glabrum; styli 3·3-4mm. longi, bifidi, brachiis filiformibus. Fructus haud visus.

JOHOR: Gunong Pulai, *Ridley* 12176!, 12194!

The very scattered rufous stellate hairs on the lower surface of the lamina are characteristic of this species.

C. confusum. Species *C. Griffithii* affinis sed floribus in racemi axe haud fasciculatis distincta.

Frutex vel arbor. Ramuli 2-4mm. crassi, straminei, primo parcissime et minute stellate pubescentes, mox glabri. Lamina tenuiter coriacea, ovate elliptica vel lanceolata, 5-25cm. longa, 2·5-8·5cm. lata, apice caudate acuminato, basi cuneata, margine integro vel brevissime undulato vel subserrato distanter et minute glanduloso; pagina superior obscura, glabra; pagina inferior obscura, glabra vel parcissime et minute stellate lepidota; costa media et nervi in utraque pagina tenues; nervi laterales in costae mediae utraque parte 6-12, excurvati et propter marginem anastomosantes; nervuli irregulares; petiolus tenuis, ·5-4cm. longus, parcissime et minute stellate hirsutus vel glaber, saepe versus laminam peltate 2-glandulosus. Flores ♂ et ♀ saepe in racemis separatis dispositi sed interdum flores ♀ pauci apud racemi masculini basim adsuut; flores albi, pedicellati, solitarii, basaliter 1-bracteati, 2-5mm. distantes; bracteae triangulares vel lanceolatae, vix ·5mm. longae, parce subsetosae. Florum ♂ pedicelli tenues, 1mm. longi, parce

minute stellate hirsuti; calyx subglobosus, 1·5mm. in diametro, fere ad basim 5-partitus; sepala leviter imbricata, membranacea, ovata, integra, extus parce stellate hirsuta, intus glabra, apice barbato; petala 5, oblonge linearia, integra, membranacea, in utraque pagina glabra, margine lanoso; discus calycis basim vestiens, tenuiter carnosus, 5-lobulatus, lanosus; stamina in disco inserta, 11, bi-serialia uno centrale, exteriora ante petala, interiora ante disci lobulos opposita; filamenta glabra, basibus disci capillis occultis; antherae ovoideae, basifixae, primo arcte inflectae, connectivo lato. Florum ♀ pedicelli crassiusculi, 1·5 mm. longi, parce stellate lepidoti; calyx suburceolatus, 2mm. longus, 5-partitus; sepala leviter imbricata, ovata, acuta, extus parce stellate lepidota, intus glabra; discus annularis, 3-lobulatus, lobulis ante sepala oppositis et transverse ovatis vel subreniformibus; petala 5, minutissima, flave lucida, squamiformia; ovarium obtuse trigone ovoideum, 1-2mm. in diametro, dense stellate rufe lepidotum, 3-loculare, intus glabrum; styli 3, infra uniti, supra bifidi, brachiis filiformibus. Fructus capsularis, 3-coccatus, 8mm. in diametro, 5·5mm. altus, apice alte depresso; cocci parce minute stellate lepidoti. Semina ovoidea, scarabaeoidea, 6mm. longa, 4·5mm. lata.

PENANG: Moniots Road, *Curtis* 1585 !. PERAK: Larut, *King's Collector* 5452 !. SELANGOR: Gunting Bua, *Ridley* 7642 !. MALACCA: Mount Ophir and Gunong Ledaung, *Ridley* 3170 !. SINGAPORE: Sungei Bei, *Hullet* !; Botanic Garden, *Ridley* !; Changi, *Ridley* 3446!; Bukit Timah, *Ridley* 10404!, 10860 !; Woodlands, *Ridley* 12561 !.

I have separated this species with some diffidence from the specimens under *C. Griffithii*. The flowers of both are almost identical, but the two sets of specimens look quite different, and while the female flowers are surrounded by a cluster of males in one set (those named *C. Griffithii*) both male and female flowers are solitary in *C. confusum*.

Acalypha, L.

A. siamensis, Oliver Mss. in Herb. Kew. Species ovario 2-loculato omnino distincta.

Frutex parvus. Ramuli subteretes, 1-3mm. crassi, primo parce pubescentes mox glabri; internodia 2-4cm. longa. Lamina elliptice lanceolata vel obovata, tenuiter coriacea, 1·5-10cm. longa, 1-3cm. lata, minutissime pellucide punctata, apice breviter obtuse cuspidato, margine crenate serrato, basi cuneata vel subcuneata; paginae utraquae glabrae vel pagina inferior capillos perpaucos minutissimos in costa media et nervis exhibens; nervi laterales in costae mediae utraque parte 5-7,

excurvati et propter marginem anastomosantes; nervuli irregulares; petiolus ·2-1cm. longus, semiteres, parce pubescens vel glaber; stipulae 2-3mm. longae, rigidae, late triangulares, apice subulato, glabrae vel perpaucos capillos minutissimos exhibentes. Spicae in axillis solitariae; axis gracilis, flexuosus, ad 7cm. longus, angulatus, parce puberulus, infra modo 3-4 florum ♀ bracteas conspicuas distantes supra glomerulos masculinos plus minusve distantes minutos gerens. Bracteae femineae late ovatae vel suborbiculares, 6mm. longae et latae, tenuiter carnosae, omnino glabrae, basi cordata, margine crasse et irregulariter 12-14-dentato. Flores ♀ in bractearum axillis solitarii, subsessiles minute 2-bracteolati; sepala 3, lanceolata, ad 1·5mm. longa, glabra, margine ciliolato; ovarium late ovoideum, 2mm. in diametro, 2-loculare, papillis crassis subulatis 1mm. longis obtectum, papilla um apicibus glandulosis et setulosis; loculi 1-ovulati; styli 2, crassi, carnosi, subulati, quam ovario duplo longiores, recurvati, extus setosi, intus dense fimbriati. Fructus et semina haud visa. Bracteae masculinae 1-2mm. distantes, integrae, leviter concavae, 1mm. longae et latae, margine ciliolato; flores ♂ in bractearum axillis plurimi, minutissimi, brevissime pedicellati, bracteolis permultis subhyalinis late lanceolatis vel linearibus plumosis cincti, in alabastro vix ·5mm. in diametro, obtuse quadrigone subglobosi; sepala 4, valvata, obovata vel breviter subspathulata, glabra, extus cristata; stamina 8, centralia, conferta; filamenta brevissima; antherae comparate magnae, crasse vermiformes, apice fixae, loculis liberis et divergentibus.

TRINGGANU: Bundi, *Rostado* !. KELANTAN: *MacGill* !. PERAK: Ulu Temango, *Ridley* 14522 !. PAHANG: Kwala Beru, *Ridley* 2306 !; Katapang, *Ridley* 1291 !; Pekan, *Ridley* !; Palau Timau, *Burkill* 994 !. DISTRIB. Tenasserim (*Ahmadali*, 111 and *Shaik Mokim* 35 !) and Siam (Christie ! Bangtaphan, *Keith* !)

Oliver sent his sheet of this species to Möller at Geneva in 1869. Müller in a letter to Oliver referred the species to a variety *glabrata* of *A. eremorum* Müll. Arg. without apparently comparing the Siamese sheet with the specimen of *A. eremorum*. The Siamese sheet is quite distinct from *A. eremorum*. I at first was disposed to separate this species as a new genus but the rather curious ovary is scarcely enough on which to base a new genus.

Coelodepas, Hask.

C. subcordatus. Aliis speciebus peninsularibus laminae basi subcordata staminibus 6-7 et pistillodio magno satis distincta.

Arbor. Ramuli subteretes, glabri, brunnei, 1-3mm. crassi; internodia ·5-2·5cm. longa. Lamina oblonge lanceolata, tenuiter coriacea, 6-16cm. longa, 2·5-4·5cm. lata, apice acuminato, basi breviter cordata,

margine in dimidio basale integro in dimidio apicale brevissime distante et minute glandulose serrato; utraque pagina nitida vel subnitida, glabra, costa media et nervis prominentibus; pagina inferior propter basim glandulas 2 parvas disciformes exhibens; nervi laterales in costae mediae utraque parte 9-13, excurvati et propter marginem anastomosantes; nervuli subparalleli, 2-4mm. distantes; reticulatio irregulariter polygonalis; petiolus crassiusculus, 2-4mm. longus, dense stellate pubescens vel glandulis minutissimis squamiformibus subpellucidis (capillorum basibus) obtectus; stipulae scariosae, 3mm. longae, anguste lanceolatae, integrae vel breviter et obtuse 1-2-dentatae, parce minute stellate pubescentes vel glabrae. Inflorescentiae paniculae axillares, parvae, spiciformes, ad 4cm. longae, prope basim parce ramulosae; ramuli graciles, angulati, minute fulvo-pubescentes, apud basim 1-paucos flores ♀ parvos sessiles et supra flores ♂ minutos sessiles in glomerulis parvis 1-3mm. distantibus congregatos gerentes; glomeruli minute 1-bracteati, bracteis late ovatis vix ·5mm. longis in pagina superiore glabris in inferiore pubescentibus. Flores ♂ in glomerulis pauci vel numerosi, subturbinati, 1mm. longi; calyx membranaceus, 3-4-partitus, extus plus minusve minute pubescens, intus glaber; stamina 6-7; filamenta crassa, glabra, carnosa, basibus unitis, versus antheras angustata; antherae minutae, ovoideae, introrsae; pistillodium magnum, crassum, glabrum, subcylindratum, apice concavo. Flores ♀ 3-bracteati, bracteis lanceolatis vel triangularibus 1-1·5mm. longis, extus plus minusve parce stellate pubescentibus intus glabris; calyx cupuliformis, tenuiter carnosus, 2mm. in diametro, ovarium amplectens, obtuse triangulariter 8-dentatus, extus dense intus minus dense stellate pubescens; discus O; ovarium trigone ovoideum, dense stellate pubescens, 3-loculare, loculis 1-ovulatis; stylus brevis, crassissimus, stellate pubescens, trifidus; brachia ovarium multo excedentia, cervicornuformia, divergentes, papillose fimbriata.

PENANG: Penara Bukit, *Curtis* 1271!. PANGKOR, *Curtis* 1374!

Coelodiscus, Baill.

C. subcuneatus. Species *C. montano* affinis sed staminibus 40-60, disco intrastaminale plano et filamentis glabris recedit.

Arbor 10-12 m. alta, foliis oppositis exstipulatis inaequalibus, uno paris altero duplo majore. Ramuli subteretes vel obtuse angulati, 2-4mm. crassi, plus minusve stellate fulvo-tomentosi vel glabrescentes; internodia 1-8cm. longa. Lamina tenuiter coriacea, ovata, 6-27cm. longa, 2·5-11cm. lata, apice acuminato, basi subcuneata, margine

integro vel brevissime undulato minute distanter glanduloso; pagina superior obscura vel subnitida, glabra vel in costa media minute puberula, prope basim glandulis minutis maculiformibus paucis munita, costa media et nervis tenuibus; pagina inferior obscura, stellate puberula et minutissime granose glandulosa, costa media nervis et nervulis prominentibus; nervi laterales in costae mediae utraque parte 4-10, excurvati et propter marginem anastomosantes, pare infimo cum costa media basim 3-plinerviam fingente; nervuli transversi, subparalleli, 2-8mm. distantes; petiolus gracilis, subteres, ·8-8cm. longus, stellate fulvo-pubescens. Flores ♂ in spicis vel racemis spiciformibus axillaribus dispositi; spicae vel racemi in axillis plerumque singuli, 1·5-4cm. longi, axe crassiusculo sulcato subterete vel plus minusve compresso dense stellate tomentoso; florum fasciculi 3-4-floriferi, 1-bracteati, compacti, bracteis lanceolatis integris, 3-4mm. longis, extus stellate intus minute adpresse pubescentibus; calyx sessilis, in alabastro obtuse polygonale ovoideus, 2mm. longus, tenuiter crustaceus, extus dense granose stellate tomentosus, intus dense granose glandulosus, denique 3-4-partitus; disci 2, unus extra-staminalis membranaceus glaber breviter cupuliformis vel annularis calycis basim vestiens, alter intra-staminalis ovalis vel rotundus planus glaber; stamina perplurima, 40-60, discum interiorem cingentia; filamenta glabra, basibus plus minusve connatis; antherae minutissimae, ovatae, 2-loculares, loculis divergentibus lateraliter dehiscentibus. Inflorescentia feminea non visa. Infructescentiae racemi in axillis singuli, 4-6cm. longi, axe stellate fulvo-tomentoso vel pubescente, pauce fructiferi; bracteae iisdem inflorescentiae masculinae similes sed modo 1-fructiferae; fructus pedicellus gracilis, 1-2·5cm. longus, stellate fulvo-tomentosus; calyx fere ad basim 3-partitus; sepala subaequalia, lineare lanceolata, 3mm. longa, extus stellate pubescentia, intus parce puberula vel glabra. Fructus immaturus obtuse trigone depresse subglobosus, 3-locularis, loculis 1-seminatis, dense stellate tomentosus et minute granose glandulosus, spinis mollibus plurimis 1mm. longis crasse subulatis stellate puberulis munitus; stylus 1mm. longus, crassus, teres, stellate pubescens, in brachia 3 recurvata subulata extus stellate pubescentia intus papillose fimbriata divisus; pericarpium coriaceum, intus glabrum. Semina globose ovoidea, 7mm. longa et lata.

KEDAH: Langkawi, *Curtis* 2584!; Gurun, *Robinson & Kloss* 6173!.

PERAK: *Scortechini* 530b!, *King's Collector* 10967!.

SELANGOR: Dusun Tua, *Ridley* 7647!.

Mallotus, Lour.

M. brevipetiolatus. Species M. *lancifolio* affinis sed lamina penninervia distincta.

Frutex ad 5m. altus, foliis oppositis exstipulatis. Ramuli primo compressi, deinde subteretes, 3-4mm. crassi, glabri, straminei, lenticellati, eglandulosi vel glandulas perpaucas minutas exhibentes; internodia 5-8cm. longa. Folia paris leviter inaequalia; lamina oblanceolata, tenuiter coriacea, 5-17cm. longa, 2·2-5·2cm. lata, apice breviter cuspidate acuminato, basi contracta rotundata breviter subcordata, margine integro vel brevissime undulato prope costae mediae basim glandulis 2 ovatis maculiformibus minutis munito vel omnino eglanduloso; pagina superior glabra, obscura vel subnitida; pagina inferior glabra, eglandulosa vel parcissime pellucide granose glandulosa; nervi laterales tenues, in costae mediae utraque parte 8-14, excurvati et propter marginem anastomosantes; nervuli irregulares; petiolus subteres, crassiusculus, glaber, 2-3mm. longus. Inflorescentiae masculinae paniculae graciles, racemiformes, multo-floriferae, ad 20 cm. longae, plerumque apud nodos singulariter dispositae; axis angulatus, plus minusve compressus, glaber, plus minusve granose glandulosus, flores in glomerulis 2-5 mm. distantibus 1 bracteatis 9-12-floriferis gerens; bracteae late ovatae, subacutae, 1 mm. longae, glabrae, extus parce granose glandulosae. Flores pedicellati, pedicellis 1-3 mm. longis in ramulorum pedicelloideorum aequilongorum apicibus articulatis; calyx in alabastro subglobose ovoideus, membranaceus, 1·5-2mm. longus, glaber, utrinque parce minute granose glandulosus vel intus eglandulosus, denique ad basim 3-partitus; sepala leviter inaequalia, 3mm. longa, ovata; stamina 20-22, extrorsa; antherae ovatae, dorsifixae, loculis parallelis. Inflorescentia feminea haud visa. Infructescentiae racemi 7-10 cm. longi, graciles, compressi, parce minute puberuli et granose glandulosi, apud nodos singuli; bracteae iisdem inflorescentiae masculinae similes sed 1-floriferae. Fructus pedicellus verus modo 1-2 mm. longus, in ramulo pedicelloideo 4 mm. longo articulatus, parce puberulus et granose glandulosus; capsula 3-coccata, vix 1cm. alta, glabra, minute granose glandulosa et processibus paucis verruciformibus vix 1mm. longis munita; epicarpium et mesocarpium tenuissima, endocarpium lignosum. Semina subglobosa, 7 mm. in diametro; testa crustacea, tegumento tenuiter carnoso induta.

PERLIS: Bukit Lagi, *Ridley* 15222 !. PERAK: *King's Collector* 4298 !, 8202 !.

M. smilaciformis. Species *M. cuneato* Ridley affinis sed lamina ovata et glandulis rubris distincta.

Frutex, foliis oppositis exstipulatis. Ramuli compressi vel subteretes, brunnei, 1-4 mm. crassi, plus minusve minute puberuli, et granose rubro-glandulosi; internodia 2·5-10 cm. longa. Lamina membranacea vel tenuiter coriacea, ovata, 7·5-22 cm. longa, 3-11·5 cm. lata, apice caudate acuminato, basi cuneata vel subcuneata, margine subintegro vel breviter undulato et minute distanter glanduloso-dentato; pagina superior obscura vel subnitida, glabra, prope basim glandulis minutis ovatis maculiformibus munita, costa media et nervis tenuibus; pagina inferior obscura, dense et minute granose rubro-glandulosa, in nervorum axillis fulvo-hirsuta, aliter glabra: nervi laterales in costae mediae utraque parte 3-5, excurvati et propter marginem anastomosantes, pare infimo cum costa media laminae basim 3-nerviam fingente; nervuli irregulares; petiolus gracilis, subteres, ·5-4 c.m. longus, minute puberulus et parce granose rubro-glandulosus. Inflorescentiae masculinae racemi graciles, 6 cm. longi, axillares, apud nodos plerumque singuli, axe angulato plus minusve compresso puberulo et granose rubro-glanduloso. Flores secundum axim in glomerulis 1-bracteatis 3-4-floriferis 1-3 mm. distantibus versus axis apicem confertis dispositi, pedicellati, pedicellis in ramulorum pedicelloideorum brevissimorum apicibus articulatis, plus minusve puberulis et granose rubro-glandulosis; bracteae triangulares, vix 1 mm. longae, extus plus minusve puberulae et granose rubro-glandulosae, intus glabrae; calyx in alabastro subglobose ovoideus, membranaceus, 1 mm. in diametro, extus parce minute stellate puberulus, et granose rubro-glandulosus, intus dense granose rubro-glandulosus, 3-partitus; sepala subaequalia, ovata; stamina 33, exteriora saltem introrsa; filamenta glabra; antherae late ovatae, dorsifixae, connectivo crasso in parte posteriore minutissime glandulose foveolato, loculis parallelis. Inflorescentia feminea masculinae similis sed bracteae paulo majores et 1-floriferae; calyx ad basim 6-partitus; sepala subaequalia, 1·5 mm. longa, lineara oblonga vel anguste lanceolata, acuminata, extus parce minute stellate puberula et granose glandulosa, intus glabra; ovarium obtuse trigonum, depressum, 3-coccatum, 2 mm. in diametro, parce puberulum, dense granose rubro-glandulosum et processibus brevissimis subulatis indutum; stylus brevissimus vel obsoletus; stigmata 3, recurvata, lineare oblonga, 2 mm. longa, extus granose rubro-glandulosa, intus plumose papillosa. Capsula 3-coccata, 6 mm. alta, glabra, plus minusve granose rubro-glandulosa et processibus verruciformibus parce munita; epicarpium et mesocarpium tenuissima, endocarpium lignosum, vix 1 mm. crassum, intus fibrose rugulosum. Semina subgloboса, 4-5 mm. in diametro.

PERAK: Lalema, *King's Collector* 3134!, 3145!.

B **lumeodendron**, Kurz.

B. vernicosum (Hooker f.). Comb. nov. *Mallotus? vernicosus* Hook. f. in Fl. Brit. Ind. V, 443.

B. concolor. Species *B. Kurzii* affinis sed staminibus 20-25 distincta. Frutex vel arbor. Ramuli teretes, glabri, brunnei, 4-5 mm. crassi; internodia 2-3·5 cm. longa. Folia opposita, exstipulata, paris unum altero majus; lamina ovata, coriacea, 19-23 cm. longa, 8-10·5 cm. lata, omnino glabra, utrinque nitida vel subnitida, apice cuspidato-acuminato, basi cuneata, margine integro, glandulis 2-4 minutis ovatis maculiformibus munita, costa media et nervis et nervulis utrinque prominentibus; nervi laterales in costae mediae utraque parte 6, excurvati et propter marginem anastomosantes, pare infimo cum costa media folii basim 3-nerviam fingente; nervuli transversi, subparalleli, 2-7 mm. distantes; petiolus crassiusculus, subteres, glaber, 5·5-7·5 cm. longus. Flores ♂ ad nodos fasciculati et pedicellati, pedicellis teretibus gracilibus 1-1·2 cm. longis ad ramulorum brevissimorum pedicelloideorum ex tuberculis aptorum apices articulatis; calyx in alabastro globosus, 4 mm. in diametro, minute apiculatus, fere ad basim 3-partitus; segmenta subaequalia, late ovata, 4-5 mm. longa, omnino glabra; discus centralis, conspicuus, hemispherice turbinatus, irregulariter plurisulcatus, glaber, carnosus, 1·5-2 mm. in diametro; stamina 22-25, libera, 4 mm. longa; filamenta glabra, basibus in disci sulcis immersis; antherae late ovatae, 1 mm. longae, basifixae, connectivo lato, loculis parallelis, longitudinaliter dehiscentibus. Flores ♀ et fructus haud visi.

PANGKOR: *Curtis* 1368 !.

Macaranga, Thou.

M. setosa. Species *M. Lowii* King affinis sed petiolo laminae costa media et margine strigosis vel setosis recedit.

Frutex vel arbor. Ramuli obtuse angulati vel teretes, 2-4 mm. crassi, parce strigosi et primo parce minute granose glandulosi; internodia 1·2 cm. longa. Folia alternantia, stipulata; lamina ovata vel oblonge ovata, coriacea, 10-17 cm. longa, 4·5-9 cm. lata, apice acuminato, basi rotundata cordata, margine subintegro vel brevissime undulato minute glandulosodentato caduciter strigose ciliato; pagina superior obscura, glabra vel in costa media parce strigosa; pagina inferior glaucescens, in costa media parce strigosa, minute glandulose punctata, costa media nervis et nervulis prominentibus; nervi laterales in costae mediae utraque parte 10-12,

excurvati, alii in dentes marginales terminantes alii propter marginem anastomosantes; nervuli transversi, subparalleli, 2-5 mm. distantes; petiolus gracilis, 3·5-8cm. longus, parce strigosus et minute granose glandulosus; stipulae subspinosae, subulatae, aculeatae, ·5-1 cm. longae, parce strigosae. Inflorescentiae masculinae spicae in foliorum vel cicatricum axillis singulae, graciles, 4-12cm. longae, axe breviter sulcato plus minusve puberulo et minute granose glanduloso. Flores secundum axim in glomerulis 1-bracteatis, 10-12-floriferis dispositi, sessiles; glomerulorum inferiorum bracteae stipulaceae superiorum late lanceolatae, fasciculos leviter excedentes, extus plus minusve pubescentes et parce strigosae et minute granose glandulosae, intus glabrae; calyx subturbinatus, 1 mm. longus et latus, fere ad basim 3-partitus; sepala late ovata, subaequalia, concava, extus plus minusve dense granose glandulosa et setas 2-3 longas exhibentia, intus glabra; stamina 10-12; antherae 4-locellatae. Flores ♀ et fructus haud visi.

JOHOR: Sungei Ulu Sembrong, *Lake* and *Kelsall* [1].

M. incisa. Species margine inciso ab aliis speciebus peninsularibus distincta.

? Frutex vel? arbor. Ramuli 1-2 mm. crassi, longitudinaliter sulcati, plus minusve puberuli, fusco-brunnei; internodia 1-5 cm. longa.

Folia alterna, caduciter-stipulata; lamina late ovata vel trilobata, lobis lateralibus inaequilateralibus, membranacea, 5-8cm. longa, 6·9cm. lata, apice vel apicibus acuminatis, basi cordata, margine sinuate et crassiter dentato-inciso, dentibus 3-6 mm. longis glandulis minutissimis praefixis; pagina superior subnitida, in costa media et nervis tenuibus plus minusve puberula; pagina inferior obscura, in costa media nervis et nervulis prominentibus plus minusve puberula, minute granose glanduloso-punctata; nervi laterales in costae mediae utraque parte 4-5, excurvati et in glandulas marginales excuntes, nervis infimis laminae basim 5-7-plinerviam fingentibus; nervuli transversi, subparalleli, 2-4 mm. distantes; nervuli secondarii irregulares; petiolus gracilis, puberulus, 4·5-10 cm. longus; stipulae membranaceae, late ovatae, 2 mm. longae, 5 mm. latae, utrinque parce pubescentes, extus plus minusve minute granose glandulosae, denique reflexae. Inflorescentiae masculinae paniculae magnae, laxe ramosae, multo-floriferae, ad 30 cm. longae, axe longitudinaliter sulcato puberulo infra pedunculoideo; rami et ramuli apud basim 1-bracteati, bracteis deciduis oblongo ovatis 4-6 mm. longis integris utrinque pubescentibus extus minute granose glanduloso-punctatis. Bracteae floriferae in glomerulis 4-6-mm. longis subconiformibus capitatis apud ramulorum apices congregatae, florum fasciculos multo excedentes, late ovatae, acutae vel

rhomboidales, sessiles vel brevissime late petiolatae, penninerviae, utrinque minute pubescentes, extus parce minutissime granose glandulosae, intus apud basin aut dense pubescentes aut contra florum fasciculos glabrae, margine breviter obtuse pectinato-dentato glanduloso, costa media et nervis lateralibus prominentibus et in dentes marginales exeuntibus. Flores ♂ in bractearum axillis fasciculati; flores in fasciculo 12 vel pauciores, 1 mm longi cum pedicello glabro vel parce puberulo, extus pubescentes, intus glabri, 3-partitus, sepalis subaequalibus ovatis concavis; stamina 2; antherae 4-locellatae. Flores ♀ et fructus haud visi.

SELANGOR: Kwala Lumpur, *Ridley* 4081.

M. puncticulata. Species *M. Curtisii* Hk. f. affinis sed ramulis glabris et laminae pagina inferiore densissime minutissime punctata differt. Arbor? vel frutex?. Ramuli 1 cm. crassi, brunnei, glabri; internodia 1·5-3·5 cm. longa. Folia alterna, caduciter stipulata; lamina late ovata, tenuiter coriacea, 18-22 cm. longa, 15-18 cm. lata, apice acuminato, basi late rotundata et peltata, margine integro vel brevissime undulato et minute obtuse glanduloso; pagina superior obscura vel subnitida, glabra, costa media et nervis tenuibus, reticulatione obscura; pagina inferior obscura, glaucescens, dense et minutissime punctata, in costa media et nervis et nervulis tenuibus prominentibus parce minutissime puberula; nervi laterales in costae mediae utraque parte 8-10, excurvati et in glandulas marginales exeuntes; laminae basis radiate 6-7-nervia; nervuli transversi, subparalleli, 3-8 mm. distantes; petiolus subteres, saepe paulo supra basim contractus, ad 24 cm. longus, parce minutissime puberulus vel glaber, cum lamina a margine basale 4-5 cm. conjunctus; stipulae delapsae. Inflorescentia masculina haud visa. Infructescentiae racemi axillares, solitarii, pauco-fructiferi, 3-9 cm. longi, subteretes, plus minusve puberuli vel rufo-tomentosi, axis parte basale pedunculoidea. Fructus versus racemorum apices glomerulati, pedicellis 2-2·5 mm. longis crassiusculis rufo-tomentosis, bracteis delapsis; calyx breviter cupuliformis, irregulariter 3-5-fidus, extus rufo-tomentosus; capsula 3-coccata, immatura 1·1 cm. in diametro, dense et minute granose glandulosus et verrucis parvis glabris disciformibus munitus; stigmata 3, sessilia, minuta, crasse subulata, recurvata; pericarpium coriaceum. Semina immatura.

JOHOR:—Tempayan river, *Ridley* 13259!.

M. recurvata. Species *M. puncticulatae* affinis sed laminae pagina

inferiore dense granose glandulosa haud punctata et fructus pedicello glabro differt.

Arbor vel ? frutex. Ramuli 3-9 mm. crassi, glabri, fusco-brunnei, foliorum et stipularum cicatricibus prominentibus; internodia ·5-8 cm. longa. Folia alterna, deciduestipulata; lamina coriacea, late ovata, peltata, 16-30 cm. longa, 10-20 cm. lata, apice acuminato, basi rotundata vel late truncata, margine breviter undulato contra nervos laterales obtuse glandulose dentato; pagina superior nitida vel subnitida, glabra, costa media nervis et nervulis tenuibus; pagina inferior obscura, glabra, glaucescens, dense et minutissime granose glandulosa, costa media nervis et nervulis prominentibus; nervi laterales in costae mediae utraque parte 10-12, excurvati, in dentes marginales exeuntes et propter marginem anastomosantes; laminae basis radiate 7-8-nervia; nervuli transversi, subparalleli, 2-8 mm. distantes; petiolus crassiusculus, subteres, glaber, 10-16 cm. longus; stipulae late oblonge ovatae, acutae, coriaceae, integrae, 1·5-2·2 cm. longae, nervis longitudinalibus parallelis. Inflorescentiae masculine paniculae angustae, compactae, laxe breviter ramosae, bracteatae, in foliorum vel cicatricum axillis singulae, 3-7 cm. longae, basi pedunculoides; panicularum ramuli 1-3 cm. longi, bracteis caducis stipuliformibus basalibus muniti, floribus versus ramulorum apices congregatis. Bracteae floriferae hexastiche imbricatae, florum fasciculos multo excedentes, late ovatae vel lanceolatae, obtuse acuminatae, coriaceae, 4-5 mm. longae, 3-4 mm. latae, margine obtuse subcrenate dentato et plus minusve excurvato, extus parce minutissime granose glandulosae, intus glabrae et prope basim dense minutissime granose glandulosae. Flores in fasciculo 6-8, cum pedicellis 1 mm. longis, subclavati, glabri; calyx irregulariter 2-3-fidus, lobis concavis; stamina 1-2, filamentis brevibus, antheris 4-locellatis. Inflorescentiae femineae racemi crassiusculi vel paniculae parce et breviter ramosae 6-12 cm. longae in foliorum vel cicatricum axillis singulae, ramulis 1 cm. longis vel brevioribus, bracteis basalibus caducis munitis. Bracteae floriferae caducae; flores in bractearum axillis singuli, pedicellis glabris subteretibus 2 mm. longis; calyx cupularis, ovarium arcte amplectens, membranaceus, 2·5-3mm. in diametro, primo integer, mox irregulariter 2-3-fidus, parce minutissime ciliolatus; ovarium subglobosum, dense et minutissime granose glandulosum, 2-4 (plerumque 3)-loculare; stigmata 2-4, sessilia, minuta, crasse subulata, recurvata. Fructus non visus.

SINGAPORE:—Bukit Mandai, *Ridley* 10420!; Bukit Timah, *Ridley*!; Mandai, *Ridley* 10934 !.

Ptychopyxis, Miq.

P. angustifolia. Species *P. costata* Miq affinis, sed lamina fere glabra, basi subcuneata, petiolo longiore et fere glabro differt. Arbor ad 25 m. alta, ramis patentibus. Ramuli 2-5 mm. crassi, primo parce fulvo-pubescentes, mox glabri, lenticellati; internodia ·4-2 cm. longa. Folia alterna; lamina elliptice lanceolata vel oblanceolata, tenuiter coriacea, 13-23 cm. longa, 3·5-7 cm. lata, apice breviter caudate acuminato, margine integro, basi subcuneata; pagina superior obscura, glabra vel in costae mediae basi parce adpresse hirsuta; pagina inferior superiori similis; nervi laterales in costae mediae utraque parte 9-12, excurvati et propter marginem anastomosantes; nervuli subparalleli, 1-3mm. distantes; petiolus gracilis, 2-3 cm. longus, parce puberulus vel glaber; stipulae haud visae. Inflorescentiae masculinae paniculae in axillis singulae vel plurimae, racemiformes vel pauce ramosae, axe 3-14-cm. longo, ramis brevioribus, axe et ramis obtuse angulatis vel plus minusve compressis et fulvo-pubescentibus; flores secundum axim et ramos in glomerulis 3-bracteatis ·2-1·5 cm. distantibus congregati; bracteae lanceolatae, utrinque plus minusve pubescentes, centrales 3-mm. longae, laterales breviores, quaeque in axilla ramulos 3 pedicelloideos teretes hirsutos crassiusculos vel noduliformes minute bracteolatos gerens; in quaque axilla ramulus pedicelloideus centralis laterales excedens. Flores pedicellati; pedicelli 1-8 mm. longi, teretes, plus minusve puberuli, ad ramulorum pedicelloideorum apices articulati; calyx in alabastro subglobosus, 2·5-3 mm. in diametro, fere ad basim 4-fidus, segmentis subaequalibus integris valvatis ovatis tenuiter carnosis 2·5 mm. longis extus adpresse pubescentibus intus parce puberulis; stamina circa 70, in receptaculo centrale magno hemispherico disposita, circa 1 mm. longa, introrsa; filamenta glabra, filiformia, apice aculeato et in antherae dorso prope basim inserto; antherae late ovatae, connectivo lato scutiforme producto glabro vel capillos paucos minutos exhibente; antherarum locellae inaequales, anteriores quam posterioribus minores; dehiscentia longitudinalis; squamae minutissimae, carnosae, hirsutae, in receptaculo cum filamentis interspersae. Inflorescentia feminea non visa. Infructescentiae paniculae racemiformes, in foliorum vel cicatricum axillis singulae, ad 5 cm. longae, axe 3-4 mm. crasso fulvo-pubescente vel glabrescente, ramulos 2-3 mm. longos fulvo-pubescentes 3-bracteatos 1-fructiferos 1-6 mm. distantes gerentes; bracteae late lanceolatae, subulatae, acuminatae, 2 mm. longae, fulvo-pubescentes. Fructus pedicellus 1 mm. longus, fulvo-pubescens, ad

ramuli apicem articulatus; calyx persistens, 5-fidus, segmentis triangularibus 1 mm. longis integris utrinque minute adpresse pubescentibus. Fructus drupaceus, obovoideus, 2·3cm. longus, 1·8cm. latus, dense minute rufo-velutinosus, plus minusve cerebriforme rugulosus, 3-locularis, loculis 1-seminatis, apice lineas suturales 3 exhibente; stigma sessile, 3-fidum; pericarpium 5 mm. crassum, coriaceum. Semina immatura plane scarabaeoidea, 1 cm. longa, 4 mm. lata.

KEDAH: Gunong Raya, *Haniff* 15637 !. PENANG: Waterfall Gardens, *Curtis* 3567 !, *Ridley* !. PERAK: Larut, *King's Collector* 7678 !, 7685 !.

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BY
W. T. SAXTON, M.A., F.L.S., I.E.S.

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ADDITIONAL NOTES ON PLANTS OF NORTHERN GUJARAT

BY

W. T. SAXTON, M.A., F.L.S., I.E.S.

1. *Introduction.*

IN 1918 Mr. L. J. Sedgwick and the present writer published in these Records an account,[1] completed two years previously, of the plants of Northern Gujarat. These notes, in the form of additions and corrections, are intended merely to supply information supplementary to that account. No ecological work is included here so as to avoid questions of opinion as far as possible, and the notes should be read in conjunction with the previous account, to which references are made throughout.

During the last three and a half years sixty-four additional species of phanerogams (including three new families and twenty-four new genera) have been found in Northern Gujarat. Of these, thirteen were collected in Lunawada State, which is some distance west of the boundary of the area previously worked, but still east of the Panch Mahals, and so included in the same ecological and geographical region. The remaining additions are all from Ahmedabad and Prantij.

The systematic position of the plants named is indicated by numbering them to correspond with the serial numbers in the previously published list, " A " following a number indicating that the new plant precedes that number in the old list, " B " that it follows it. References to plants in the former list, other than additional species or well marked varieties, are given in square brackets.

2. PHANEROGAMIA.

DICOTYLEDONEÆ.

1A. Ranunculus sceleratus Linn. F. B. I. I, 19; Fl. Bomb. I, 5. Stream bed in a deep Wângha near Prantij. Flowers February. Rare. *Saxton*, 2921 !

[1] Plants of Northern Gujarat by W. T. Saxton and L. J. Sedgwick. (*Records Bot. Survey of India, VI, 205—323, 1918.*)

5B. Tinospora cordifolia Miers. F. B. I. I, 97; Fl. Bomb. I, 18. Frequent in hedges round Ahmedabad. Flowers March.

7B. Nymphæa stellata Willd. F. B. I. I, 114; Fl. Bomb. I, 25. Common in tanks. Flowers September.

10B. Cleome monophylla Linn. F. B. I. I, 168; Fl. Bomb. I, 36. Occasional in cultivated land. Flowers August.

32B. Bergia ammannioides Roxb. F. B. I. I, 251; Fl. Bomb. I, 73. Fairly common in swamps. Flowers November.

[42. **Hibiscus micranthus** Linn. is common round Ahmedabad.]

71B. Corchorus tridens Linn. F. B. I. I, 398; Fl. Bomb. I, 150. Fairly common in Savannah. Flowers August.

89B. Zizyphus horrida Roth. F. B. I. I, 636; Fl. Bomb. I, 243. Lunawada jungles. Flowers May. Collected by Mr. *K. R. Bharucha*.

290B. Vitis quadrangularis Wall. F. B. I. I, 645; Fl. Bomb. I, 250. In hedges. Ahmedabad. Not common. *Saxton*, 3155!

[98. **Heylandia latebrosa** DC. is *occasional*, not very common.]

108B. Medicago lupulina Linn. F. B. I. II, 90; Fl. Bomb. I, 306. Margins of the Bokh, Prantij. Locally common. Flowers February.

109B. Melilotus alba Lamk. F. B. I. II, 89. The Bokh, Prantij. Not common. Flowers February. *Saxton*, 2931!

117B. Indigofera tinctoria Linn. F. B. I. II, 99; Fl. Bomb. I, 318. Occasional. Flowers September and after.

138 B. Desmodium spirale DC. F. B. I. II, 164. In jungles, Lunawada. Not common. Flowers October. *Saxton*, 1934! This

plant, not previously recorded, apparently, for the Bombay Presidency, is also found in the Panch Mahals, where it is not uncommon.

151B. Dalbergia Sissoo Roxb. F. B. I. II, 231; Fl. Bomb. I, 395. Lunawada jungles. Flowers and fruits May. Collected by Mr. *K. R. Bharucha.*

157B. Cassia Sophera Linn. F. B. I. II, 262; Fl. Bomb. I, 419. Occasional by roadsides, but not easily distinguished at sight from *C. occidentalis* Linn., which is abundant. Flowers December.

161B. Cassia Absus Linn. F. B. I. II, 265; Fl. Bomb. I, 424. Frequent in lanes and hedges. Flowers September.

[**173. Acacia leucophloea** Willd. Two well marked forms are met with, differing in the relative length and breadth of the pod. Perhaps they should rank as distinct varieties.]

178B. Albizzia odoratissima Benth. F. B. I. II, 299; Fl. Bomb. I, 452. Lunawada jungles. Flowers May. Collected by Mr. *K. R. Bharucha.*

[**180. Vahlia viscosa** Roxb. is common in swamps near Ahmedabad in November and December.]

185B. Combretum ovalifolium Roxb. F. B. I. II, 458; Fl. Bomb. I, 484. Lunawada jungles. Flowers and fruit March. Collected by Mr. *K. R. Bharucha.*

200B. Trichosanthes palmata Roxb. F. B. I. II, 606; Fl. Bomb. I, 526. In jungles, Lunawada. Occasional. Fruit October. Determined Calcutta.

201B. Momordica Charantia Linn. F. B. I. II, 616; Fl. Bomb. I, 528. Frequent in hedges. Flowers August—September.

203B. Luffa ægyptiaca Mill. F. B. I. II, 614; Fl. Bomb. I, 532. Frequent in hedges. Flowers August.

205B. Citrullus vulgaris Schrad. F. B. I. II, 621; Fl. Bomb. I, 537. River bank. Presumably an escape. Flowers August. *Gammie*, 16386! *Saxton*, 1783!

216B. Mollugo Cerviana Seringe. F. B. I. II, 663; Fl. Bomb. I, 559. Fairly common in cultivated land. Flowers July—August.

216C. Mollugo nudicaulis Lamk. F. B. I. II, 664. Common in cultivated land. Flowers early monsoon, and during the cold weather in irrigated land.

222B. Gardenia turgida Roxb. VAR. **montana** Hook. f. (?) F. B. I. III, 118; Fl. Bomb. I, 601. Rare, and not yet seen in flower or fruit. Doubtfully referred to this species at Calcutta, and agrees very closely with some sheets of the variety. *Saxton*, 1721!

[225. Should probably be referred to *Morinda tinctoria* Roxb. VAR. *tomentosa*, Hook. f. and not to *M. citrifolia* Linn.]

231B. Blumea Wightiana DC. F. B. I. III, 261; Fl. Bomb. II, 19. Fairly common. *Saxton*, 2099! See note below the next species.

231C. Blumea lacera DC. F. B. I. III, 263; Fl. Bomb. II, 20. Very common on dry sandy soil during the cold weather. Flowers January—March. *Saxton*, 2795!

It is, as Hooker remarks, very difficult to distinguish the two last-named species. The first has purple flowers, the second yellow, but I can find no other clear difference. Hooker mentions the "sparsely hairy achenes" of *B. Wightiana*, but in my specimens the achenes of the purple flowered plant are practically glabrous, while those of *B. lacera* are sparsely hairy and rather larger. I suspect that the two plants should rather be considered varieties of one species, but the materials at my disposal are not sufficient to express a confident opinion.

232B. Pluchea lanceolata C. B. C. (Oliv.) F. B. I. III, 272; Fl. Bomb. II, 26. On a dry vertical bank of a Nullah, Ahmedabad. Flowers August—October. Rare. *Saxton*, 1812!

The leaves, always twisted edgewise to the stem, recall the phyllodes of Australian Acacias.

239B. Xanthium Strumarium Linn. F. B. I. III, 303; Fl. Bomb. II, 37. Locally common on the inner slopes of the Limbla Dam, Prantij. Flowers February—March. *Saxton*, 2903! Determined Calcutta.

243B. Bidens pilosa Linn. F. B. I. III, 309; Fl. Bomb. II, 44. Frequent in shady places. Flowers August—September.

245B. Senecio vulgaris Linn. Bentham and Hooker. Handbook of the British Flora, 7th Edition, p. 244. A weed in Victoria Gardens, Ahmedabad. Flowers March. *Saxton*, 2966!

[**264.** This species is probably distinct from *Wrightia tinctoria* R. Br., either a well marked variety or a new species, but efforts to obtain the flowers have at present failed.]

267A. Hemidesmus indicus R. Br. F. B. I. IV, 5; Fl. Bomb. II, 146. Occasional in jungles at Lunawada. Flowers October.

[**274. Leptadenia reticulata** W. & A. A form or variety with very narrow leaves has been found near Ahmedabad. Rare. Flowers in March when the ordinary form is in ripe fruit. *Saxton*, 2898!]

276B. Mitreola oldenlandioides Wall. F. B. I. IV, 79. Fl. Bomb. II, 181. Fairly common at Lunawada. Flowers October.

280B. Canscora diffusa R. Br. F. B. I. IV, 103; Fl. Bomb. II, 191. Frequent on the river bank, Lunawada. Flowers October.

292B. Trichodesma indicum R. Br. VAR. **amplexicaule** Sedgwick. Rec. Bot. Surv. Ind. VI, 347—350. 1919. *Trichodesma amplexicaule* Roth. F. B. I. IV, 154. Much more common than the type. Flowers July—September.

292C. Trichodesma zeylanicum R. Br. F. B. I. IV, 154. Fl. Bomb. II, 215. Frequent in dry fields. Flowers January—February.

292D. Sericostoma pauciflorum Stocks. F. B. I. IV, 175; Fl. Bomb. II, 220. In dry woodland Savannah. Somewhat rare. Flowers July. *Saxton*, 1719!

298B. Hewittia bicolor W. & A. F. B. I. IV, 216; Fl. Bomb. II, 231. Occasional in hedges. Flowers September.

[**310. Ipomoea obscura** Ker.-Gawl. Is abundant in hedges, and flowers from August to March.]

[**313. Ipomoea hederacea** Jacq. is frequent in hedges round Ahmedabad, and is certainly fully naturalized, if not truly wild.]

314B. Ipomoea quinquefolia Griseb. Occasional in hedges round Ahmedabad, as an escape. Flowers February. *Saxton*, 2868!

[**327. Celsia coromandeliana** Vahl. The ordinary form has been seen in flower in August, in the bed of the Sabarmati, at Ahmedabad, but is not common.]

328B. Stemodia viscosa Roxb. F. B. I. IV, 265; Fl. Bomb. II, 288. Not uncommon in dried swamps. Flowers January—February.

329B. Mimulus gracilis R. Br. F. B. I. IV, 259; Fl. Bomb. II, 287. Sabarmati river bank. Not common. Flowers November—December. Determined Calcutta.

330B. Dopatrium junceum Buch.-Ham. F. B. I. IV, 274; Fl. Bomb. II, 292. Locally common in marshes, but very evanescent. Flowers September.

333B. Bonnaya veronicaefolia Spreng. F. B. I. IV, 285; Fl. Bomb. II, 298. Locally common in marshy places. Flowers September. *Saxton*, 2440! Determined Calcutta.

334B. Veronica Anagallis Linn. F. B. I. IV, 293; Fl. Bomb. II, 301. In wet sand of Nullahs, Ahmedabad and Prantij. Not common. Flowers February.

341B. Orobanche aegyptiaca Pers. Fl. Bomb. II, 314. *O. indica* Buch.-Ham. F. B. I. IV, 326. Seen once on cabbages in cultivated land in March, close to Ahmedabad. Locally very common.

342B. Utricularia arcuata Wight. F. B. I. IV, 330; Fl. Bomb. II, 318. In a swamp near Ahmedabad. Flowers October. Very rare. *Saxton*, 2559!

[**349. Tubiflora acaulis** O. Kunze. This plant is very sporadic. In 1919 it was common and freely flowering round Ahmedabad. In 1920 and 1921 it was difficult or impossible to find a flowering specimen. The note in small type under this species should be deleted.]

[**355** and **356.** These two *Ruellias* were badly confused in the former list, partly owing to the inaccuracy of the descriptions in the Floras. No. 355 is **Ruellia prostrata** Lamk. VAR. **dejecta** C. B. C., as determined by Calcutta Herbarium. No. 356 is specifically distinct from 355, but is probably typical **R. patula** Jacq., the description of flower colour in Hooker's F. B. I. and Cooke's Fl. Bomb. being wrong. *Saxton*, 1093, however, should be excluded, being a white flowered form of 355. The proposed variety *alba* should be dropped, as although there are certainly two rather distinct varieties of this species in Western India, both have white flowers, and, in any case, fuller study of a wide range of specimens is necessary to clear them up satisfactorily.]

368B. Dicliptera micranthes Nees. F. B. I. IV, 553; Fl. Bomb. II, 402. Occasional in swampy land under bushes. Flowers January.

[**377. Moschosma polystachyum** Benth. is occasional round Ahmedabad. Flowers January.]

381B. Leucas nutans Spreng. F. B. I. IV, 688; Fl. Bomb. II, 463. On the bank of a Nullah, Ahmedabad. Rare. Flowers August. *Saxton*, 1815!

406B. Polygonum barbatum Linn. F. B. I. V, 37. Watrak river, Occasional. *Sedgwick*, 1169! Determined Calcutta.

408B. Aristolochia indica Linn. F. B. I. V, 75; Fl. Bomb. II, 524. In jungles at Lunawada. Rare. Flowers October. *Saxton*, 1938!

409B. Viscum articulatum Burm. F. B. I. V, 226; Fl. Bomb. II, 553. Lunawada. On *Diospyros melanoxylon* Roxb., rare. Fruit February. Collected by Mr. *K. R. Bharucha*.

[**411** and **412.** There are possibly more than two *Euphorbias* of this type. They are under further investigation.]

417B. Euphorbia granulata Forsk. F. B. I. V, 252. Fl. Bomb. II, 569. In a dry exposed field, half buried in loose sand. Not common. Flowers January. *Saxton*, 2847!

427B. Phyllanthus debilis Herb.-Ham. F. B. I. V, 299; Fl. Bomb. II, 588. Lunawada jungles. Flowers August. Collected by Mr. *K. R. Bharucha*.

432B. Acalypha ciliata Forsk. F. B. I. V, 417; Fl. Bomb. II, 611. Occasional in lanes. Flowers August.

[**435. Streblus asper** Lour. is common.]

MONOCOTYLEDONEÆ.

[**449.** Is wrongly named and should be **Monochoria vaginalis** Presl.]

[**451. Commelina benghalensis** Linn. is fairly common round Ahmedabad.]

451B. Commelina Hasskarlii Clarke. F. B. I. VI, 370; Fl. Bomb. II, 781. Fairly common in swampy land. Flowers September.

452B. Cyanotis cristata Schultes. F. B. I. VI, 385; Fl. Bomb. II, 794. Lunawada, in shady damp places. Flowers October. This is a common species in the Panch Mahals.

452C. Cyanotis axillaris Schultes. f. F. B. I. VI, 388; Fl. Bomb. II, 795. In a swamp, Ahmedabad. Rare. Flowers September—October. *Saxton*, 2473!

[**459. Butomopsis lanceolata** Kunth. is common in marshes near Ahmedabad.]

460A. Aponogeton monostachyum Linn. f. F. B. I. VI, 564; Fl. Bomb. II, 837. Locally common in swamps. Flowers September.

464B. Naias major All. F. B. I. VI, 569. In tanks. Not common. *Saxton*, 2138!

The families and genera not previously included are as follows :—

(1) **Families.** Ranunculaceæ, Loganiaceae and Aristolochiaceæ.

(2) **Genera.** *Ranunculus, Tinospora, Medicago, Dalbergia, Combretum, Bryonopsis, Gardenia, Pluchea, Xanthium, Bidens, Senecio, Hemidesmus, Mitreola, Sericostoma, Hewittia, Stemodia, Mimulus, Dopatrium, Veronica, Dicliptera, Aristolochia, Viscum, Cyanotis* (two species), *Aponogeton.*

3. CRYPTOGAMIA.

Pteridophyta.

Adiantum lunulatum Burm. River bank at Lunawada. Not common.

Marsilia minuta Linn. Marshy places, Ahmedabad. Determined Calcutta.

Azolla pinnata R. Br. Very common on tanks. Determined Calcutta.

Bryophyta.

A species of **Riccia** is very common during the monsoon. Another species occurs on damp ground in partly dried tanks in the cold weather.

Thallophyta.

Hydrodictyon occurs in the Bokh, Prantij. **Enteromorpha** has been found in a freshwater stream near Prantij in February. **Spirogyra** (several species), **Zygnema, Closterium, Cladophora, Oedogonium, Ulothrix, Volvox, Gonium, Pandorina,** various **Diatoms, Nostoc, Anabaena, Rivularia, Oscillatoria** and several other **Myxophyceæ** all occur, and some of them are very common. Among Characeæ, **Chara zeylanica** Willd., **Chara contraria** Kutzing. and **Nitella hyalina** Agardh.,—kindly named by Mr. James Groves from specimens submitted to the Director of Kew—are common in the Watrak and other rivers, and elsewhere, and it is likely that other species occur.

Among Fungi, a species of **Lycoperdon** is common in sandy ground in the rains. **Sphaerobolus carpobolus** Linn. has been seen once. A species of **Podaxon** is not uncommon in the rains. The same is true of **Coprinus comatus** Fr. which can hardly be distinguished from it in external appearance. One or two other species of **Coprinus** and a few other small **Agarics** are fairly common, a species of Polystictus has been noted and a large phalloid, perhaps a **Clathrus,** was once seen. **Fomes lucidus** Fr. is sometimes found parasitic on the roots of the "Nim." Other parasitic fungi noted are **Ustilago** on Cereals and *Cyperaceæ*, an **Aecidium** on leaves of *Amaryllis Belladonna*, and another Aecidium on leaves of *Rivea hypocrateriformis*, but an area more free from fungus diseases would perhaps be difficult to find.

No Lichen has been noted at present.

4. SYSTEMATIC SYNOPSIS.

The following now replaces the synopsis given on p. 218 of "Plants of Northern Gujarat."

The numbers of families, genera and species (and recognised varieties) in each class are as follows :—

	Dicotyledons.	Monocotyledons.	Total.
Families . . .	77	14	91
Genera . . .	300	70	370
Species . . .	500	178	678

Of the 177 species of Monocotyledons 148 belong to *Cyperaceæ* and *Gramineæ*. The ratio of Monocotyledons to Dicotyledons is 1 : 2·81. The average number of species per genus is 1·83.

The largest *families*, including all with eight or more species, are as follows :—

1. Gramineæ with 104 species in 39 genera.
2. Leguminosæ with 92 species in 43 genera.
3. Cyperaceæ with 45 species in 8 genera.
4. Compositæ with 29 species in 24 genera.
5. Convolvulaceæ with 26 species in 10 genera.
6. Euphorbiaceæ with 26 species in 8 genera.
7. Acanthaceæ with 22 species in 16 genera.
8. Malvaceæ with 21 species in 8 genera.
9. Scrophulariaceæ with 18 species in 15 genera.
10. Cucurbitaceæ with 18 species in 11 genera.
11. Tiliaceæ with 14 species in 3 genera.
12. Amarantaceæ with 13 species in 9 genera.
13. Boragineæ with 13 species in 6 genera.
14. Labiatæ with 12 species in 6 genera.
15. Asclepiadaceæ with 11 species in 9 genera.
16. Capparidaceæ with 10 species in 6 genera.
17. Solanaceæ with 10 species in 5 genera.
18. Rubiaceæ with 9 species in 8 genera.
19. Ficoideæ with 8 species in 3 genera.

The largest genera, including all with four or more species, are as follows :—*Cyperus* 20, *Panicum* 13, *Ipomoea* and *Eragrostis* 12 each, *Euphorbia*, *Fimbristylis* and *Andropogon* 11 each, *Hibiscus*, *Crotalaria*, *Indigofera*, and *Acacia* 9 each, *Alysicarpus*, *Cassia* and *Scirpus* 8 each, *Corchorus* 7, *Zizyphus*, *Leucas*, *Phyllanthus*, *Eleusine* and *Chloris* 6 each, *Grewia*, *Ammannia*, *Solanum*, *Ficus* and *Sporobolus* 5 each, *Sida*, *Tephrosia*, *Mollugo*, *Blumea*, *Heliotropium*, *Merremia*, *Pennisetum* and *Digitaria* 4 each.

Of the 370 genera, 264 are represented by only a single species, while the same is true of 27 families out of 91.

5. SPECIES NOT MENTIONED BY COOKE.

The following species in this list are not mentioned in Cooke's Flora of the Bombay Presidency :—

(1) Truly wild.

1. *Melilotus alba* Lamk. 2. *Desmodium spirale* DC. 3. *Mollugo nudicaulis* Lamk. 4. *Trichodesma indicum* R. Br. VAR. *amplexicaule* Sedgwick. 5. *Polygonum barbatum*, Linn. 6. *Naias major* All.

(2) Introduced weeds or escapes from cultivation.

1. *Ipomoea quinquefolia* Griseb. 2. *Senecio vulgaris* Linn.

Neither of these plants is mentioned in Hooker's Flora of British India.

6. ACKNOWLEDGMENTS.

Acknowledgments are due to the Director and to the Curator of the Herbarium, Royal Botanic Garden, Calcutta, who have kindly named the species marked " Determined Calcutta " ; also to the Director of Kew and Mr. James Groves, who kindly named the *Characeæ* mentioned above, and to Mr. K. R. Bharucha who has collected plants for me in Lunawada from time to time.

ADDENDUM.

Since the above notes first went to press the following additional plants have been collected :—

47B. Hibiscus ficulneus Linn. F. B. I. I, 340 ; Fl. Bomb. I, 110. Occasional in swampy land. Flowers September.

114B. Indigofera anabaptista Steud. F. B. I. II, 102 ; Fl. Bomb. I, 313. Flowers and fruits August. Single specimen only. *Saxton*, 3140 !

203C. Bryonopsis laciniosa Naud. Fl. Bomb. I, 534. *Bryonia laciniosa* Linn. F. B. I. II, 622. Occasional in hedges. Flowers August—September.

204B. Cucumis Melo Linn. VAR. **agrestis** Naud. Fl. Bomb. I, 535. Frequent. Flowers August—September.

208A. Blastania fimbristipula Kotschy and Peyr. Fl. Bomb. I, 541. *Ctenolepis cerasiformis* Naud. F. B. I. II, 630. Occasional in Thorn Savannah. Flowers and young fruits October. *Saxton*, 3230 !

604B. Eleusine flagellifera Nees. F. B. I. VII, 294 ; Fl. Bomb. II, 1038. Occasional in Thorn Savannah. Flowers July. *Saxton*, 3061 !

The above are included in the systematic synopsis on pp. 260, 261.

Bryophyta. Notothylas sp. Occasional on swampy ground in October.

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BY

NELLIE CARTER, D.Sc.

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No. 4. *Instead* of (Walroth) *read* (Wallroth).

No. 6. *Instead* of S. thermalis, *read* ? **S. thermalis.**

Page 268—

No. 8. Forma minor. *Instead* of gracillioribus, *read* gracilioribus.

No. 9. *Instead* of P. Thomasianum, *read* ? P. Thomasianum.

Page 269—

No. 11. 4 lines down. *After* Alg. New Guinea, *insert* Flora 83, 1897. *Delete* 1900.

7 lines from bottom, *instead* of **BACILLARIAE** *read* **BACILLARIEAE.**

Page 270—

No. 15. *Instead* of Heiv. *read* Heib. Next line, *instead* of Kütz *read* (Kütz.)

8 lines from top, *instead* of **FRAGILLARIACEAE,** *read* **FRAGILARIACEAE,** Next line, *instead* of **Fragillaria** *read* **Fragilaria.**

Page 272—

No. 30. *Instead* of **N. brevirostrata** *read* **N. brevicostata.**

No. 32. *Instead* of **N. Brebissonia** *read* **N. Brebissonii.**

Page 274—

No. 53. Second line. *Instead* of Sembadewin *read* Sembadew in.

Page 275—

No. 57. *Instead* of S. Sm. *read* W. Sm.

Page 277—

No. 68. *After* p. 180, *insert* t. 34. Next line, *instead* of (Raphidium spirale) *read* (Raphidium spirale

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Page 279—

No. 83. Second line, *after* 50, *insert* μ; *after* 30, *insert* μ.

Page 280—

6 lines from top, *instead* of " neither of the Alga nor " *read* either of the Alga or.

Page 282—

No. 101. 4 lines down, *after* 80, *insert* μ.

Page 283—

3 lines from top, before cell becomes very swollen, *insert* ♀.

No. 105. *Instead* of Rabenh. Alg. Bur. *read* Rabenh. Alg. Eur.

No. 106. *Instead* of **C. Brebissonni** *read* **C. Brebissonii.**

Page 284—

No. 114. *Instead* of **C. calsporum** *read* **C. calosporum.**

Page 285—

7 lines from top, *instead* of p. 225 *read* p. 235.

No. 118. *Instead* of Chlor. 1899, f. 15, *read* Chlor. 1899, p. 15.

Page 286—

No. 124. *Instead* of **E. pulchellum** *read* **E. pulcherrimum.**

Page 288—

4 lines from top, *instead* of latisthm, *read* lat. isthm.

No. 136. *Instead* of **M. Crux-melitensis,** *read* **M. Crux-Melitensis.**

3 lines further on, *instead* of Hab. On ditch *read* Hab. In ditch.

Page 289—

No. 143. Second line, *after* Racib *add* a full stop

No. 145. *Instead* of p. 39, t. 15, f. 15, *read* p. 39, t. 2, f. 15.

3 lines further on, *instead* of lat. 40μ, *read* lat. 49μ.

No. 146. *After* Ralfs Brit. *delete* comma

No. 149. *Instead* of **C. Garrolense** R. & R., *read* **C. Garrolense** R. & B.

Page 292—

No. 173. *Instead* of Ehr. Inf. 1858 *read* Ehr. Inf. 1838.

Page 294—

No. 189. *Insert* a full stop *after* Turn.

No. 194, Var. **aequale.** *Instead* of Var. processibus, *read* Var. processubus.

Page 295—

No. 196. *Instead* of Var. **microcanthum** *read* Var. **micracanthum.**

Page 296—

No. 200. *Delete* a full stop *after* Hirn.

Page 297—

No. 208. *Delete* a full stop after Var. **perfecta** Hirn.

Page 299—

Second line from top, *instead* of Algarum inicellularum *read* Algarum unicellularum.

9 lines from top, *instead* of Sussw. *read* Süssw., and *instead* of Uber, *read* Über.

Omit the 24th and 25th lines from top.

Line 30, *instead* of Untersuchungen uber die. *read* Untersuchungen über die

Line 32. *Instead* of Delphonte read Delponte.

Insert, two lines from bottom :—

Gay, Note Conjugées. F. Gay. Note sur les Conjugées du midi de la France. Bull. Soc. bot. France 31. 1884.

Second line from bottom, *instead* of Goment *read* Gomont.

Page 300—

Line 20, *instead* of Varietaten *read* Varietäten.

Line 23, *instead* of Bemerkungen uber *read* Bemerkungen über.

5 lines from bottom, *instead* of Symbolaead *read* Symbolae ad.

Page 301—

4 lines from top, *instead* of Kongli *read* Kongl.
Line 25, *after* Kozlemenyek, *add* XVIII, 1882.
Last line, *instead* of African, *read* Africa.

Page 302—

Line 16, *instead* of Olands Sotvattens-Alger, *read* Olands sötvattens Alger.

In description of the plates.

FIG. 7, *instead* of var. bov. *read* var. nov.
FIGS. 9, 10, *instead* of bar. nov. *read* var. nov.
FIGS. 21-24, *instead* of van. nov. *read* var. nov.

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FRESHWATER ALGAE FROM INDIA

BY

NELLIE CARTER, D.Sc.

The Algae recorded in this paper were collected by Mr. I. H. Burkill at various times between 1906 and 1912 in India. A considerable amount of work has already been done on the algal flora of the Indian region, and a complete list of the literature relating to it will be found in W. & G. S. West, Freshwater Algae from Burma, etc., 1907, so that it is unnecessary to refer to these papers here.

The majority of the collections were made near the North-Eastern frontier, in North Cachar, the Assam plains, and in the Sikkim and Abor Himalayas. A number also came from the North-West Himalayas near Simla, or from Nepal. The remaining samples were collected in the Plain of the Ganges, on the Satpura Hills in the Central Provinces, from Akyab, or in the Dawna Hills.

Most of the samples were taken at fairly high altitudes, varying from 2,000 ft.—10,000 ft., whilst a few of the collections were made at about 400 ft. —700 ft. The latter, as would be expected proved to be much richer than the former; in fact nearly half the species recorded here occurred in a single sample taken from a ditch in a rice field near Sadiya at 400 ft. in which over 90 species were recognised. These included many of the beautiful and striking Desmids of the Indo-Malayan type (see W. & G. S. West. Alg. Burma 1907).

An extremely interesting find amongst the comparatively lowland collections was a small form of *Oocardium stratum* Näg. freely conjugating. This extraordinary Desmid has only previously been recorded from Great Britain, France and Germany, and is regarded as very rare, and the zygospores have not previously been seen. Its discovery amongst the Indian Algae is therefore of extreme interest, and it is possible that the Alga is quite generally distributed in limestone localities.

The collections from higher altitudes were very different in character, and much poorer as regards number of species. There was a complete absence amongst the Desmids of those Indo-Malayan types so striking in the localities

of lesser altitude, their place being taken by Desmids of a more ubiquitous or even alpine character.

Certain interesting records are made for species only hitherto known from Europe. For example, *Cosmarium Garrolense*, described by Roy and Bissett from Scotland, occurred in a collection taken from Mount Tonglu at 10,000 ft. in the Sikkim Himalayas, in company with *C. quadratum* f. *Willei*, only previously known from Northern Europe and Siberia.

The occurrence in the North-Western Himalayas at 8,500 ft. of a form of *Debarya* very near to *D. desmidioides* described by W. & G. S. West from Cornwall is of further interest. It is peculiar also that *Fragillaria Ungerianum*, the Diatom whose long ribbon-like colonies are so common in the North-West Himalayas and also in the Central Provinces, was not observed at all in the collections from the North-Western Himalayas.

Although the collections were perhaps not sufficiently numerous to make very definite statements possible, the investigation has proved interesting in indicating that the Indo-Malayan type of Desmid is confined to the comparatively low-lying districts of the area, and that altitude is a factor which plays a part in the distribution of Desmids, just as in the higher plants.

This investigation was carried out at the University of Birmingham during the period 1919-1921 with the aid of a grant from the Department of Scientific and Industrial Research. The author wishes to acknowledge the kindness of Professor R. H. Yapp for allowing her the facilities of the Botanical Department and also to express her gratitude to Dr. J. S. Bayless-Elliot for constant encouragement.

A list of the collections is given below :—

25390.

26847. Near Erki on the west of Simla, a dry region of gravels near the edge of the hills ; about 3,000 ft. May 9, 1906.

26880. Namoli in the same neighbourhood ; at 4,000 ft. May 11, 1906.

26924. Suket. May 16, 1906.

26955. Hills above Gere upon the east of Suket, at about 7,000 ft. ; a region of woods of pines and oaks. May 17, 1706.

27047. Alsundi in the State of Suket at about 4,000 ft. May 20, 1906.

27075. Suni in the hot valley of the Sutlej at about 2,100 ft., and immediately north of Simla. May 21, 1906.

27295. } Collected some time between June and August, 1906 ; no definite
27296. } information regarding locality available.

27542. Green film from cut surface of jute stumps exhuding water by root-pressure. Bardwan in the Bengal plain, Sept. 15, 1906. (This consisted chiefly of minute unicells, probably once motile, but so badly preserved that identification was impossible. N.C.)

24918. From the north side of the very wet mountain of Tonglu at 9 500 ft. Oct. 2, 1906.
27737. From the mountain of Tonglu at 10,000 ft. Oct. 2, 1906.
27701. From a shallow pond on the water-parting at 11,600 ft., to the north of Sandakphu. Oct. 1, 1906.
27643. From a running stream in forest of *Abies Webbiana* between Sandakphu and Phallut at 11,000 ft. Sept. 28, 1906.
27959. Between Naya and Nataran on the Pichoung at the northern edge of the Akyab district, a region of forests. Jan. 5, 1907.
27976. Near Nataran. Jan. 7, 1907.
28013. Yinma on the Kalapanzin river, in the north-west of the Akyab district. Jan. 13, 1907.
28018. From a cliff over the River Kalopanzin; sandstone. Jan. 14, 1907.
28039. Pethadu, in the north-west of the Akyab district. Jan. 15, 1907.
28059. Akyab. 1907.
28064. Chittagong. 1907.
28179. River near Bhainsa Duban.
28180. Near Pursona in the Nepal Terai.
28183. Dadar, Bombay. 1908.
28134. Green Alga which is very hardy in Calcutta. 1908.
28683. From rocks in streams at Matiana on the so-called Tibetan road which goes into the interior of the Himalayas from Simla; altitude 8,500 ft. April 30, 1907.
28684. From a shaded pool at 8,500 ft. above Matiana. Date as previous number.
28697. From Theog on the same road at 8,300 ft. April 28.
28825. From a dirty pond, yellow with clay, at Mahasu on the same road. Collected by Dr. Annandale.
28842. From near Kakarhatti at various springs between 2,500 and 2,800 ft. May 9, 1907.
28857. From near Kasauli, in pools along a rocky streamlet which doubtless runs dry upon the face of the hills over the plains. May 11, 1907.
29361. Raxaul on the Nepal border; from a stream. Nov. 25, 1907.
29904. From the cold snow-water of the Trisuli river under Niakot, Nepal. Dec. 11, 1907.
30294. Dawna Hills, scrapings off wet rocks, at about 2,000 ft. March 3, 1908.
30346. Summit of the Dawna Hills at about 3,000 ft., from a damp rock facing north. March 4, 1908.

30372. Kawkareik, at the foot of the Dawna Hills; algae from floating leaves in a marsh on the west side of Kawkareik. March 25, 1908.

30607. Pa-gnat, south of Amherst, from a pond on the edge of saline rice land. March 12, 1908.

30636. Moulmein, in the waterworks. March 19, 1908.

31090. From stream about to dry up on the east face of Asirgarh Hill. Sept. 27, 1908.

31099. From Chandni, in a running stream at the base of the hill. Sept. 28, 1908.

31345. From water under rocks at Sembadew in the Sipna valley. Oct. 18, 1909.

31268. In the Sipna stream. Oct. 10, 1909.

32700. On the crest of the pass, Haflong. Alt. 2,200 ft. Aug. 28, 1909.

32671. Washings from *Ceratophyllum*, R. Kundil, near Sadiya in the Assam valley. Middle of Aug. 1909.

32672. Washings from *Lemna* and *Wolffia*. Locality and date as the preceding number.

32658. Ditches of still water. Date and locality as before.

32683. From ditch at edge of rice field. Date and locality the same. (The altitude of Nos. 32671, 32672, 32658 and 32683 is about 400 ft.)

33018. Haflong in the Jatinga valley. Altitude 2,000 ft. In fairly permanent stream. Aug. 28, 1909.

33019. In running water of a less permanent nature. Same date and locality as the preceding number.

33044. From running water near Jatinga station, altitude 1,800 ft. Aug. 29, 1909.

33045 } At a distance of 10 yds. within the tunnel at Jatinga station.
33046 } Aug. 29, 1909.

33047. Haflong in the North Cachar Hills at 1,800 ft. in slowly running water upon the side of the railway line. Aug. 29, 1909.

36169. From small stream under Pongging in the Abor Hills at 700 ft. Jan. 21, 1912. (*Oocardium stratum* N.C.)

36212. From trunks in oak forest at 5,500 ft. upon the water parting between the Serpe and Igar streams. Jan. 23, 1912.

36239. From earth in forest at 4,500 ft. in the hills south of Rotung. Jan. 24, 1912. (This number consists entirely of moss-protonema; I am deeply indebted to Dr. F. E. Fritch for kindly confirming my decision on this point. N.C.)

37400. From the River Dihang under Rotung at 700 ft. Jan. 25, 1912.

37689. From the River Dihang between Puak and its tributary the Side river at 900 ft. Jan. 5, 1912.

SYSTEMATIC.

MYXOPHYCEAE.

CHROOCOCCACEAE.

Genus **Chroococcus** Näg.

1. **C. turgidus** (Kütz.) Näg.
   Var. **fuscescens** (Kütz.) Forti in De Toni, Syll. Alg. 5, p. 13, 1907.
   Hab. (25390).

Genus **Glococapsa** Kütz.

2. **G. polydermatica** (Kütz.) De Toni, Syll. Alg. 5, p. 51, 1907.
   Hab. Wet rocks at 2,000 ft., Dawna Hills (30294).

Genus **Merismopedia** Meyen.

3. **M. elegans** A. Br. in Kütz. Spec. Alg. 1849, p. 472.
   Hab. Suket (26924); River Dihang, under Rotung (37400).

OSCILLATORIACEAE.

Genus **Oscillatoria** Vauch.

4. **O. violacea** (Walroth) Hass. De Toni, Syll. Alg. 5, p. 179, 1907.
   Hab. In stream just about to dry up. Asirgarh Hill (31090).

Genus **Lyngbya** Ag.

5. **L. Loriae** Forti in De Toni, Syll. Alg. 5, p. 286, 1907.
   Diam. fil. 2·5-3·5μ ; diam. trich. 1·8-2·5μ ; long. artic. 2·5·5 μ.
   Hab. Forming a stratum on mud in running water near Jatinga station (33044).

Genus **Symploca** Kütz.

6. **S. thermalis** (Kütz.) Rabenh. Flor. Eur. Alg. II, 1868, p. 153.
   Diam. fil. 2·25μ ; diam. trich. 1 μ ; long. artic. 1·5-3·5 μ.
   Hab. Namoli, at 4,000 ft. (26880) ; amongst mosses on the Mountain of Tonglu at 10,000 ft. (27737). Not present in sufficient quantity for certain determination.

NOSTOCHACEAE.

Genus **Anabaena** Bory.

7. **A. oscillarioides** Bory, 1822, Forti in De Toni, Syll. Alg. 5, 1907, p. 451.
Hab. In rice field near Sadiya (32683).

Genus **Microchaete** Thur.

8. **M. uberrima** sp. nov. **Pl. I, figs. 1-3.**

Filis elongatis, usque 5 mms. longis, absolute cylindraceis, basi breviter decumbentibus, stellato-fasciculatis, trichomatibus bruneolis, diametro 10-14 μ, cellulis plerumque subquadratis, vaginis solidis diametro 16-18 μ, fuscescentibus, heterocystis basalibus intercalaribusque, his cylindraceis, illis sphaericis vel leviter depressis, sporis longe seriatis olivaceis, quadratis vel subcylindricis.

Hab. Sadiya, in ditch at edge of rice field (32683).

Forma **minor** n. f. **Pl. I, fig. 4.**

Filamentis gracillioribus, diametro 9-11 μ, trichomatibus diametro 6·5 -8 μ.

Hab. With the typical form (32683).

This species occurred in great quantity amongst *Spirogyra* and *Oedogonium* spp. It was forming spores in great quantity, entire filaments being so transformed at once (Pl. I, f. 2). The spores had a very distinct wall, and granular contents. The filaments were of great length, and showed no sign of attenuation. The intercalary heterocysts are peculiarly angular, and the vegetative cells on either side are attenuated towards it in a characteristic way. It is nearest to *M. robusta* Setchell and Gardner 1903, but differs in the apex of the filament, the cells of which are neither shortened nor torulose, nor do they differ in colour from the rest of the filament. There is also a difference in the sheath, which is brownish, and quite homogeneous.

SCYTONEMACEAE.

Genus **Plectonema** Thur.

9. **P. Thomasianum** (Kütz.) Born. in Bull. Soc. bot. de France xxxv, p. 155; Forti in De Toni Syll. Alg. 5, 1907, p. 490.
Hab. In temporary stream, Haflong in the Jatinga Valley. Alt. 2,000 ft. (33019). Identification uncertain since specimen had been dried for some years and could not be restored to a satisfactory condition.

Genus **Scytonema** Ag.

10. **S. subtile** Moeb. in Flora, 1892, p. 448.
Hab. Mountain of Tonglu at 10,000 ft. (27737).
The specimens only differed from the Australian ones of Moebius in that the sheath was distinctly yellow instead of colourless.

11. **Scytonema** sp.
Crass. fil. 5 μ ; crass. trich. 2 μ. ad apicem 3 μ ; cellulis diametro ca. 6-plo longioribus, ad apicem quadratis.
Hab. With the preceding species (27737).
This Alga seems nearest to *S. tenuissimum* Schmidle (Alg. New Guinea, 1900), but differs in several respects. It was forming minute erect fascicles amongst mosses, dark-brown in colour and about 2mms. high. The sheaths of the filaments were colourless, and the trichomes yellowish-green. The branches were not frequent but usually in pairs. Heterocysts were also rare and were $1\frac{1}{2}$ times to twice longer than broad. The sheaths were perfectly smooth and showed no sign of being encrusted with lime. The Alga may be new, but was not sufficiently abundant to describe accurately.

STIGONEMACEAE.

Genus **Stigonema** Ag.

12. **S. hormoides** (Kütz.) Born. & Flah. Rev. III, p. 68.
Hab. Suket (26924) ; with the preceding species (27737).

RIVULARIACEAE.

Genus **Calothrix** Ag.

13. **Calothrix** sp.
Hab. Shady pool above Matiana at 8,500 ft. (28684).
The specimens were fragmentary, scattered amongst other Algae and insufficient for determination.

BACILLARIAE.

MELOSIRACEAE.

Genus **Melosira** Ag.

14. **M. varians** Ag. 1830 W. Sm. Brit. Diat. II, p. 57.
Hab. In springs near Kakarhatti between 2,500 and 2,800 ft. (28842) ; in the Dihang River, between Pusk and its tributary the Side River (37689).

DIATOMACEAE.

Genus **Diatoma** D.C.

15. **D. hiemale** (Lyngb.) Heiv. Van. Heurck Synops. t. 51, f. 1, 2.
    Var. **mesodon** Kütz. Van Heurck Synops. t. 51, f. 3, 4. (*Odontidium mesodon* Kütz.)
    Hab. On the wet Mountain of Tonglu at 9,500 ft. (24918) ; in shady pool at Matiana at 8,500 ft. (28684).

FRAGILLARIACEAE.

Genus **Fragillaria** Lyngbya.

16. **F. capucina** Desm. Van. Heurck Synops. t. 45, f. 2.
    Var. **mesolepta** (Rabenh.) Van Heurck Synops. t. 45, f. 3.
    Hab. In the River Dihang, between Puak and its tributary the Side River (37689).
17. **F. Ungeriana** Grun. in Schmitz Atlas t. 298, f. 1-8.
    Hab. In various streams near Kakarhatti (28842) ; in stream about to dry up, Asirgarh Hill (31090) ; in running stream near base of the hill, Chandni (31099) ; in the Sipna stream (31268) ; in water under rocks, Sembadew, in the Sipna Valley (31345).

The isolated frustules of this Diatom bear a strong resemblance to *Synedra Ulna*, but the striations are much coarser. Very abundant as ribbon-like colonies.

Genus **Synedra** Ehrenb.

17. **S. Ulna** (Nitzsch) Ehr. Inf. 1838, p. 211, t. 17, f. 1 ; Rabenh. Flor. Eur. Alg. 1, 1864, p. 133.
    Hab. Alsundi in the State of Suket, 7,000 ft. (27047) ; damp rocks at the summit of the Dawna Hills at 3,000 ft. (30346) ; in the Sipna stream (31268) ; in the Dihang River, between Puak and its tributary the Side River (37689).
    Var. **longissima** (W. Sm.) Van Heurck Synops. t. 38, f. 3.
    Hab. Near Nataran (27976) ; with the typical form (37869).
18. **S. acus** (Kütz.) Grun. in Abh. d. k. k. zool. botan. Gesellsch. Wien xii, 1862, p. 398.
    Hab. With the preceding species (31268, 37689).

EUNOTIACEAE.

Genus **Eunotia** Ehr.

19. **E. lunaris** (Ehr.) Grun. in Van Heurck Synops. Diat. p. 144, t. 35, f. 3-4, 6. (*Synedra lunaris* Ehr. W. Sm. Brit. Diat. 1, p. 69, t. 11, f. 82.)
    Var. **maxima** Meister, Kieselalg. Schweiz, 1912, p. 83, t. x, f. 1.
    Hab. Ditch at edge of rice field, near Sadiya (32683).
20. **E. pectinalis** (Dillw.) Rabenh. Flor. Eur. Alg. 1, 1864, p. 73 (*Himantidium pectinalis* Kütz. Bacill. t. 16, f. 2).
    Hab. Mountain of Tonglu at 10,000 ft. (27737).
21. **E. praerupta** Ehrenb.
    Var. **bidens** (Ehrenb.) Grun. (*Eunotia bidens*) W. Sm.
    Hab. Ditch at edge of rice field, near Sadiya (32683).
22. **E. impressa** Ehr. 1854. Meister, Kieselalg. Schweiz, 1912, p. 85, t. x, f. 5.
    Hab. With the preceding species (32683).
23. **E. major** (W. Sm.) Rabenh. Van Heurck Synops. t. 34, f. 14.
    Hab. With the preceding species (32683).
24. **E. gracilis** (Ehr.) Rabenh. Van Heurck Synops. t. 33, f. 1 and 2.
    Hab. With the preceding species (32683).

Genus **Desmogonium** Grun.

25. **D. Rabenhorstianum** Grun. Diat. u. Desm. Insel Banka. p. 6, t. 1, f. 1.
    Long. frust. 150 μ; lat. 6 μ.
    Hab. In shallow still water, Haflong (32700).

The peculiar branched colonies of this Diatom were quite frequent. The frustules were slightly curved, not in the least capitate at the apex, and the marginal granules were not nearly as prominent as figured by Grunow.

ACHNANTHACEAE.

Genus **Achnanthes** Bory.

26. **A. Biasolettiana** Grun. Van Heurck Synops. t. 27, f. 27, 28.
    Hab. In the River Dihang between Puak and its tributary the Side River (37689).

COCCONEIDACEAE.

Genus **Cocconeis** Ehrenb.

27. **C. Placentula** Ehr. Infus. 1838, p. 194.
Hab. In the River Dihang under Rotung (37400).

NAVICULACEAE.

Genus **Navicula** Bory.

28. **N. lata** Bréb.
Var. **latistriata** (Greg.) Cl. Synops. II, p. 81.
Hab. In shallow still water, Haflong, at 2,400 ft. (32700).
29. **N. stauroptera** Grun. Van Heurck Synops. t. 5, f. 7.
Var. **interrupta** Cl. Synops. II p. 83 ; Van Heurek Synops. t. 6, f. 7.
Hab. On the Mountain of Tonglu at 10,000 ft. (27737) ; in shallow still water at 2,400 ft., Haflong (32700) ; in ditch at edge of rice field near Sadiya, 400 ft. (32683).
30. **N. brevirostrata** Cl. Diat. Finl. p. 25, t. 1, f. 5.
Hab. In ditch at edge of rice field near Sadiya (32683).
31. **N. acrosphaeria** Bréb. Cl. Synops. II, p. 86.
Hab. In the Sipna Stream (31268).
32. **N. Brebissonia** Kütz. Van Heurck Synops. t. 5, f. 7.
Hab. Near Kakarhatti (28842).
33. **N. hemiptera** Kütz. Bacill. p. 97, t. 30, f. 11. (*Pinnularia hemiptera* Rabenh. Cl. Synops. II, p. 85.)
Hab. In ditch near Sadiya (32683).
34. **N. radiosa** Kütz.
Var. **tenella** (Bréb.) Van Heurck Synops. p. 84, t. 7, f. 21-22.
Hab. In stream about to dry up, Asirgarh Hill (31090) ; in the River Dihang between Puak and its tributary the Side River (37689).
35. **N. lanceolata** Kütz. Van Heurck Synops. t. 8, f. 16.
Var. **Cymbula** Cl. Synops. II, p. 22.
Hab. On the Mountain of Tonglu at 10,000 ft. (27737).
36. **N. exilis** Grun. Van Heurck Synops. t. 12, f. 11, 12.
Hab. In shallow still water, Haflong, at 2,400 ft. (32700) ; in ditch by side of rice field near Sadiya (32683).
37. **N. Iridis** Ehr.
Hab. In shallow still water, Haflong, at 2,400 ft. (32700) ; in the River Dihang between Puak and its tributary the Side River (37689).
Var. **amphigomphus** Ehr. Van Heurck Synops. t. 13, f. 2.
Hab. Near Kakarhatti (28842).

38. **N. Pupula** Kütz.
Hab. In the River Dihang (37689).
39. **N. confervacea** (Kütz.) Grun. Van Heurck Synops. t. 14, f. 36.
Hab. On the Mountain of Tonglu at 10000 ft. (27737); in the river near Bhainsa Duban (28179); in stream on Asirgarh Hill (31090); in the Sipna stream (31268).
40. **N. ovalis** Schmidt's Atlas t. 7, f. 33-36.
Var. **pumila** Grun. (*Diploneis ovalis* var. *pumila* Grun. 1882. Cl. Synops. 1, p. 92).
Hab. In water under rocks, Sembadew in the Sipna valley (31345).
41. **N. elliptica** Kütz Van Heurck Synops. t. 10, f. 10. (*Diploneis elliptica* Cl. Synops. I, p. 92.)
Hab. Near Kakarhatti (28842).

Genus **Stauroneis** Hass.

42. **S. Phoenicenteron** (Nitzsch) Ehr.
Var. **amphilepta** (Ehr.) Cl. Synops. 1, p. 149.
Hab. In ditch at edge of rice field near Sadiya (32683).
43. **S. anceps** Ehr. Van Heurck Synops t. 4, f. 4, 5.
Hab. In stream about to dry up on east face of Asirgarh Hill (31090); from Chandni near Base of Hill in running stream (31099); in the Sipna stream (31268).
Var. **amphicephala** (Kütz.) Cl. Synops. 1, p. 148.
Hab. In ditch at edge of rice field near Sadiya (32683).

COMPHONEMACEAE.

Genus **Comphonema** Ag.

44. **G. acuminatum** Ehr. Inf. 1838, t. 18, f. 4.
Var. **Turris** Ehr. 1843.
Hab. With the preceding species (32683).
45. **G. lanceolatum** Ehr. 1843.
Hab. With the preceding species (32683).
46. **G. sphaerophorum** Ehr. 1845.
Hab. In the River Dihang between Pusk and its tributary the Sido River (37689).
47. **G. subclavatum** Cl. Synops. 1, p. 183.
Hab. In water under rocks, Sembadew in the Sipna valley (31345); in the Sipna stream (31268).

COCCONEMACEAE.

Genus **Cocconema** Ehr.

48. **C. turgidula** Grun. Cl. Synops. 1, p. 171.
Hab. In the River Dihang between Puak and its tributary the Side River (37689); in the River Dihang under Rotung (37400).

49. **C. cistula** Kirchn. Cl. Synops. 1, p. 173.
Hab. With the preceding species (37689).

50. **C. obtusa** Greg. Van Heurck Synops. t. 3, f. 1a.
Hab. With the preceding species (37689).

51. **C. affinis** Kütz. Van Heurck Synops. t. 1, f. 31.
Hab. In springs near Kakarhatti (28842).

52. **C. gastroides** Kütz. Van Heurck Synops. t. 2, f. 8.
Hab. In running stream, Chandni near base of hill (31099).
Forma **minor** Van Heurck Synops. t. 2, f. 9.
Hab. With the typical form (31099).

53. **C. tumida** Bréb. Van Heurck Synops. t. 2, f. 10.
Hab. In water under rocks at Sembadewin the Sipna valley (31345); in the Sipna stream (31268).

54. **C. Reinhardtii** Grun. Cl. Synops. 1, p. 162.
Hab. In running stream, Chandni; near base of the hill (31099).

Genus **Amphora** Ehr.

55. **A. ovalis** Kütz. Van Heurck Synops. t. 1, f. 1.
Var. **gracilis** Van Heurck Synops. t. 1, f. 3.
Hab. In stream about to dry up on east side of Asirgarh Hill (31090); in running stream, Chandni, near base of hill (31099).

Genus **Rhopalodia** O.M.

56. **R. gibba** O. M. (*Epithemia gibba* Kütz. Van Heurck, Synops. t. 32, f. 1, 2).
Hab. Near Nataran (27976); in stream at Raxaul on the Nepa border (29361); in water under rocks, Sembadew in the Sipna valley (31345).

NITZSCHIACEAE.

Genus **Nitzschia** Hass.

57. **N. linearis** (Ag.) S. Sm.
Hab. In the River Dihang under Rotung (37400).

58. **N. sinuata** (W. Sm.) Grun.
Var. **Tabellaria** Grun. Van Heurck Synops. t. 60, f. 12, 13.
Hab. In the River Dihang between Puak and its tributary the Side River (37689).

59. **N. amphibia** Grun. Van Heurck Synops. t. 68, f. 15-17.
Hab. With the preceding species (31345); in the Sipna stream (31268); in running stream, near base of the hill, Chandni (31099).

Genus **Hantzschia** Grun.

60. **H. Amphioxys** (Ehr.) Grun. **Pl. 1, 16, Pl. 11, fig. 15.**
Hab. From the Mountain of Tonglu (24918, 27737); from the River Dihang under Rotung (37400).

Zygosporae quadratae, membrana ad angulos multa producta et incrassata. Long. sine pr. 18-40 μ, cum pr. 27-58 μ; lat. 19-26 μ.

In no. 27737, this diatom was quite frequent in the conjugated condition. The zygote was more or less quadrate, with a greenish hyaline membrane conspicuously prolonged and thickened at the corners. These peg-like processes at the angles projected into the delicate and collapsed remains of the old walls of the conjugating individuals. The process did not seem to be accompanied by a conspicuous increase in size as in the formation of auxospores by conjugation, and the zygote with its appendages was very similar to that of some of the Saccoderm Desmids. In some cases, however, the characteristic form and markings of the Diatom could be recognised on the walls of the conjugating cells, so that there could be no doubt whatever as to its identity.

SURIRELLACEAE.

Genus **Surirella** Turp.

[61. **S. apiculata** W. Sm. Schmidt's Atlas t. 23, f. 34, 35.
Hab. near Kakarhatti (28842).

CHLOROPHYCEAE.

VOLVOCACEAE.

Genus **Pandorina** Bory.

62. **P. morum** (Müll.) Bory. De Toni, Syll. Alg. 1, 1888, p. 539.
Hab. In ditch at edge of rice field near Sadiya (32683).

PALMELLACEAE.

Genus **Hormotila** Borzi.

63. **H. tropica** G. S. West. (*Urococcus tropicus*) W. & G. S. W. in Ann. R. Bot. Gard. Calcutta, 1907, p. 227, t. 11, f. 17-21.
Hab. On wet rocks Dawna Hills (30294).

DICTYOSPHAERIACEAE.

Genus **Westella** De Wildeman.

64. **Westella botryoides** (West) Schmidle (*Tetracoccus botryoides*) West Alg. Engl. Lake Distr. 1892, p. 735, t. x, f. 43-48.
Hab. In d tch at edge of rice field near Sadiya (32683).

AUTOSPORACEAE.

Genus **Oocystis** Näg.

65. **O. solitaria** Wittr. in Wittr. and Nordst. Alg. Exc. 1879, No. 244; fasc. 21, 1889, p. 22, cum fig.
Hab. On the Mountain of Tonglu at 10000 ft. (27737).

Genus **Nephrocytium** Näg.

66. **N. Agardhianum** Näg. Gatt. einz. Alg. 1849, p. 80, t. 111c.
Hab. In ditch at edge of rice field near Sadiya (32683).

Genus **Tetraëdron** Kütz.

67. **T. regulare** Kütz.
Var. **longispinum** Reinsch De Toni Syll. Alg. 1, 1888, p. 605.
Hab. With the preceding species (32683).

Genus **Ankistrodesmus** Corda.

68. **A. falcatus** (Corda) Ralfs, Brit. Desm. 1848, p. 180, f. 3.
Var. **spiralis** (Turn.) West. (*Raphidium spirale*) Turn. Freshw. Alg. E. India, 1893, p. 156, t. 20, f. 26).
Hab. With the preceding species (32683).

Genus **Scenedesmus** Meyen.

69. **S. bijugatus** (Turp.) Kütz.
Hab. With the preceding species (32683).
70. **S. quadricauda** (Turp.) Brèb. Alg. Falaise 1835, p. 66.
Hab. In shallow still water at Haflong (32700).
71. **S. obliquus** (Turp.) Kütz.
Hab. Ditches of still water near Sadiya (32658); living in watery fluid exhuded by root-pressure from the cut stems of jute plant, near Bardwan in the Bengal plain (27543).

Genus **Coelastrum** Näg.

72. **C. cambricum** Arch.
Hab. In ditch at edge of rice field near Sadiya (32683).
73. **C. microporum** Näg. in A. Br. Alg. unicell. 1855, p. 70.
Hab. With the preceding species (32683).
74. **C. morus** West Alg. C. Africa. 1896, p. 5, t. 361, f. 4.
Hab. In the River Dihang between Puak and its tributary the Side River (37698).
Colonies of 8 cells only were most frequent.

Genus **Sorastrum** Kütz.

75. **S. spinulosum** Näg. Gatt. einz. Alg. 1849, p. 99, t. 5D.
Hab. In ditch at edge of rice field near Sadiya (32683).

HYDRODICTYACEAE.

Genus **Pediastrum** Meyen.

76. **P. tetras** (Ehr.) Ralfs in Ann. Mag. Nat. Hist. 14, 1844, p. 469, t. 12, f. 14.
Hab. In ditches of still water Sadiya (32658); with the preceding species (32683).

77. **P. simplex** Meyen, Rabenh. Flor. Eur. Alg. 111, 1868, p. 71.
Hab. In the Sipna stream (31268).

Genus **Hydrodictyon** Roth.

78. **H. reticulatum** (L.) Lagerh.
Hab. Suket (26924); in the warm water of the Tardi River near Niakot, Nepal (29940).

CLADOPHORACEAE.

Genus **Cladophora** Kütz.

79. **C. glomerata** (L.) Kütz.
Hab. In the cold snow water of the Trisuli River under Niakot, Nepal (29904).

Genus **Pithophora** Wittrock.

80. **P. radians** W. & G. S. West Alg. Ceylon 1902, p. 132.
Hab. At Dadar, Bombay (28183).
A form sterile but probably identical with the above species occurred in No. 37689.

Genus **Rhizoclonium** Kütz.

81. **R. hieroglyphicum** Kütz.
Hab. At Dadar, Bombay (28183).

ULVACEAE.

Genus **Monostroma** (Thur.) Wittr.

82. **Monostroma** sp.
Hab. In the cold snow water of the Trisuli River (29904).
Specimen too fragmentary for accurate determination.

ULOTRICHACEAE.

Genus **Ulothrix** Kütz.

83 **U. zonata** (Webb & Mohr) Aresch.
Diam. fil. 20-50 ; long. cell. 10-30.
Hab. From rocks in stream at Matiana (28683).
84. **U. subtilis** Kütz. Phyc. Germ. 1845, p. 197, Rabenh. Flor. Eur. Alg. III, 1868, p. 365.
Var. **variabilis** (Kütz.) Kirchn.
Hab. In running water near Jatinga station and also 10 yards within the tunnel (33044, 33046) ; shallow water at Haflong (32700).
85. **U. aequalis** Kütz. Phyc. Germ. 1845, p. 197.
Hab. Running water near Jatinga station (33044).

Genus **Chaetophora** Schrank.

86. **C. pisiformis** (Roth) Ag.
Hab. In the waterworks at Moulmein (30636).

TRENTEPOHLIACEAE.

Genus **Trentepohlia** Mart.

87. **T. dialepta** (Nyl.) Hariot in Journ. de Bot. 1889, p. 193 ; Schmidle in Flora 1897, p. 306.
Diam. fil. 8-12 μ ; cum hyphis fungi 12-15 μ ; long. cell. 25-33 μ.
Hab. On trunks of trees in oak forest at 5500 ft. on the waterparting between the Serpi and Igar streams (36212).
The Alga was sterile, but it agreed very well with Schmidle's description of *T. dialepta*. The plant mass was not quite so large as in Schmidle's Alga, the plates being only about 3 cms. in diameter and 1 mm. in thickness. The

branching and form of the filaments, however, were almost identical. It is noteworthy that Schmidle states that the branches arise opposite to each other, whereas Hariot says they arise chiefly on one side of the main filament. In the Indian specimens the branches were nearly always opposite and in pairs. The lichenized Alga is of the form of the Lichen *Coenogonium*, but no fructifications, neither of the Alga nor of the Fungus, were present.

APHANOCHAETACEAE.

Genus **Aphanochaete** A. Br.

88. **A. repens** A. Br. 1851.
Hab. In ditch at edge of rice field near Sadiya (32683).

COLEOCHAETACEAE.

Genus **Coleochaete** Bréb.

89. **C. orbicularis** Pringsheim.
Hab. On floating leaves in marsh, Kawkareik (30372); with the preceding species (32683).

ZYGNEMACEAE.

Genus **Mougiotia** Ag.

90. **M. laetevirens** (A. Br.) Wittr. (*Craterospermum laetevirens*) A. Br. 1885; DeBary Conj. 1858, p. 81, t. 3, f. 1-13.
Hab. In ditch at edge of rice field near Sadiya (32683).

91. **M. tenuis** (Cl.) Wittr. in Bihang till k. Svenska vet.—akad. Handl. 1872, p. 39.
Var. **minor** Wolle Freshw. Alg. U. St. 1887, p. 233, t. 148, f. 11-15.
Diam. fil. 17-19 μ; long. cell. 120-150 μ; diam. zyg. 27-30 μ.
Hab. With the preceding species (32683).

92. **M. producta** W. & G. S. West Alg. Burma, 1907, p. 188, t. 10, f. 16-19.
Hab. With the preceding species (32683).
The specimens were in conjugation, but no aplanospores were observed.

Genus **Debarya** Wittr.

93. **D. desmidioides** W. & G. S. West, Notes Alg. 3, 1903, p. 7, t. 446, f. 1-9.

Var. **orientale** var nov. **Pl. 11, figs. 17-20.**

Var. filis longis nec facile dilabentibus, articulis parum constrictis, conjugationis tempore tantum in cellulas dissociatis.

Crass. cell. veg. 6-7 μ ; long. cell. 30-67 μ ; diam. zyg. 20-25 μ.

Hab. In shady pool above Matiana at 8500 ft. (28684).

The Alga was present in great quantity and was freely conjugating. The sterile filaments were often of great length, and the cells themselves long and slender, and only slightly convex at the apex. The structure of the cell was variable to some extent, but there were always two small pyrenoids in the middle of the cell, surrounded by the slightest film of chromatophore. The nucleus was sometimes inserted between the two pyrenoids as in *Zygnema*, but occasionally it was lateral in position. The appearance was usually more suggestive of *Zygnema* than of *Mougiotia*, but this may have been due in part to prolonged preservation in a poor fixing reagent.

During and after dissociation prior to conjugation the isolated cells were more like *Debarya desmidioides* as figured by W. & G. S. West, the ends of the cells becoming much more convex. The conjugating cells were exactly similar to the Cornish ones, the old gametangis undergoing the same changes, becoming glistening and apparently solid. Comparatively early stages in conjugation were most frequent, but one mature zygote with a golden-brown wall was observed.

It is extremely interesting that a form of a species originally described from Cornwall, should next be recorded at an altitude of 8500 ft. in the tropics.

Genus **Zygnema** Ag.

94. **Z. pectinatum** (Vauch.) Ag.

Var. **decussatum** (Vauch.) Kirchn. *Forma* cf. Carter, Freshw. Alg. New Cal. 1922, p. 65.

Crass. fil. veg. 16-18 μ ; diametro 2-4-plo longioribus ; diam. zyg. 30-40 μ, (25390).

Hab.

This Alga agreed almost exactly with that described and figured from New Caledonia. The cells were, however, slightly shorter and thicker, although conjugation was regularly lateral in the same way, scalariform conjugation occurring occasionally as a great rarity as in the earlier described Alga. The zygospores were rather better developed than before and showed a conspicuously scrobiculate membrane.

95. **Zygnema** sp. **Pl. 11, fig. 11.**

Z. akinetis cylindricis instructum, membrana interiore akinetae fusca punctata, exteriore hyalina.

Diam. cell. veg. 22-23 μ ; long. cell. 38 μ ; diam. akin. 23 μ long. 38 μ.

Hab. In shallow still water Haflong at 2400 ft. (32700).

These asexual spores are somewhat similar to those figured by De Bary for *Z. pectinatum* (Conj. 1858, t. 1, f. 15). They are formed from the ordinary vegetative cells without any change of form or size, the mature spore being exactly similar to the ordinary cell except that there is an opaque and coarsely punctate wall underlying the original one, which remains hyaline and colourless. The cells during the formation of the spores become very slightly convex, so that the filament becomes disjointed into lengths of two or three cells each.

Another species of *Zygnema* but sterile, occurred with the preceding species in No. 32700.

Genus **Spirogyra** Link.

96. **S. inflata** (Vauch.) Rabenh. Petit Spir. env. Paris 1880, p. 7.
Crass. cell. veg. 16 μ ; long. zyg. 47-56 μ ; lat. zyg. 27 μ.
Hab. In the River Dihang, between Puak and its tributary the Side River (37689).

97. **S. reticulata** Nordst. in Botan. Notiser 1880, p. 118.
Crass. cell. veg. 28 μ ; long. zyg. 70 μ ; lat. zyg. 42 μ.
Hab. With the preceding species (37689).

98. **S. cataeniformis** (Hass.) Kütz. Petit Spirogyra environ. Paris, 1880, p. 17.
Crass. cell. veg. 20 μ ; long. zyg. 46-49 μ ; lat. zyg. 25 μ.
Hab. With the preceding species (37689).

99. **S. porticalis** (Müll.) Cleve. Petit Spirogyra env. Paris, 1880, p. 21, t. 5, f. 8-12.
Hab. Between Naya and Nataran (27959) ; in stream about to dry up on east face of Asirgarh Hill (31090).

100. **S. neglecta** (Hass.) Kütz. Petit, Spirogyra env. Paris, 1880, p. 26, t. 9, f. 1-5.
Crass. cell. veg. 56 μ ; long. zyg. 70-80 μ ; lat. zyg. 54-58 μ.
Hab. In pools in a rocky streamlet near Kasauli (28857).

101. **S. fluviatilis** Hilse. Petit Spirogyra env. Paris, 1880, p. 27, t. 5, f. 13 ; Wolle, Freshw. Alg. U. S., 1887, p. 216, t. 136, f. 1-3.
Crass. cell. veg. 40 μ ; long. 135-185 μ ; lat. zyg. 43-50 μ ; long. zyg. 70-80.
Hab. In various streams near Kakarhatti, 2500-2800 ft. (28842).

102. **S. Grossi** Schmidle in Allgemeine Botan. Zeitschr. 1901, p. 3. (sep.)
Lat. cell. veg. 43-50 μ ; diam. 2-3-plo longioribus ; lat. zyg. 63 μ ; long. 87 μ ; diam. cell fruct. 80 μ.
Hab. At Pethadu (28039) ; in stream just about to dry up on east face of Asirgarh Hill (31090).

This peculiar species was fruiting abundantly in No. 31090, but the zygospores were unfortunately very immature. The vegetative cell has three or four chloroplasts with two to two and a half turns and the cell becomes very swollen. The alga in No. 31090 was very similar to *S. Grossi* Schmidle, but the vegetative cells are a little wider, as are also the fruiting cells. The zygospores in this sample were also too young to show the character of the wall described by Schmidle. The Alga in No. 28039 was more typical.

103. **S. orthospira** (Nag.) Kutz. Petit, Spirogyra env. Paris. 1880, p. 30.
Crass. cell. veg. 65μ ; diam. zyg. 65μ.
Hab. In ditch at edge of rice field near Sadiya (32683).

104. **S. maxima** (Hass.) Wittr. (*S. orbicularis* Hass.) Kütz. in Petit, Spirogyra env. Paris 1880, p. 31.
Crass. cell. veg. 90-100 μ ; diam. zyg. 110 μ.
Hab. (27295) ; in ditch near Sadiya (32658).

Other species of *Spirogyra* were observed in Nos. 26847, 28179, 32658, 33018, and 37689.

DESMIDIACEAE.

Genus **Gonatozygon** De Bary.

105. **G. Kinahani** (Arch.) Rabenh. Alg. Bur. III, 1868, p. 156 ; W. & G. S. West, Brit. Desm. 1, p. 35. (*Leptocystinema Kinahani* Arch. Suppl. Cat. Desm. 1852, p. 243, 250, t. 21, f.1-4.)
Hab. In ditch at edge of rice field near Sadiya (32683).

Genus **Cylindrocystis** Menegh.

106. **C. Brebissonni** Menegh. 1838. W. & G. S. West, Brit. Desm. 1904, p. 58, t. 4, f. 23-32. (*Penium Brebissonii* Ralfs, 1848.)
Hab. In shallow still water, Haflong (32700) ; on the Mountain of Tonglu at 10,000 ft. (27737).

107. **C. crassa** De Bary Conj. 1858, W. & G. S. West, Brit. Desm. 1904, p. 59, t. 4, f. 33-38.
Hab. With the preceding species (27737).

Genus **Netrium** Näg.

108. **N. Digitus** (Ehr.) Itzigs. & Rothe. W. & G. S. West, Brit. Desm. 1904, p. 64.
Hab. (25390).

Genus **Penium** Breb.

109. **P. Clevei** Lund. Desm. Suec. 1871, p. 86, t. 5, f. 11; W. &. G. S. West, Brit. Desm. 1904, p. 87.
Long. 76 μ; lat. 25 μ; lat. isthm. 21 μ.
Hab. In ditch at edge of rice field near Sadiya (32683).

Genus **Closterium** Nitzsch.

110. **C. Libellula** Focke 1847.
Var. **intermedium** Roy & Biss. Scott. Desm. 1894, p. 252; W. & G. S. West, Brit. Desm. 1904, p. 74.
Hab. In still water, Haflong (32700).
111. **C. parvulum** Näg. 1849; W. & G. S. West, Brit Desm. 1904, p. 133.
Lat. 20 μ; apicibis 157 μ inter se distantibus; lat. apic. 2 μ.
Hab. In ditch at edge of rice field near Sadiya (32683).
112. **C. acerosum** (Schrank) Ehr. W. & G. S. West, Brit. Desm. 1904, p. 146.
Hab. Suket (26924).
Var. **angolense** W. & G. S. West, Brit. Desm. 1904, p. 149.
Hab. With the typical form (26924).
113. **C. abruptum** W. & G. S. West, Brit. Desm. 1904, p. 158.
Lat. 22 μ; apicibus 190 μ inter se distantibus; lat. apic. 7 μ.
Hab. In ditch near Sadiya (32700).
114. **C. calsporum** Wittr. Skand. Desm. 1869, p. 23, t. 1, f. 11; W. & G. S. West, Brit. Desm. 1904, p. 138.
Lat. 9 μ; apicibus 80 μ inter se distantibus.
Hab. In ditch at edge of rice field near Sadiya (32683).

Genus **Pleurotaenium** Näg.

115. **P. Trabecula** (Ehr.) Näg. 1849; W. &. G. S. West, Brit. Desm. 1904, p. 209.
Var. **clavata** (Kütz.) W. & G. S. West Brit. Desm. 1904, p. 211 (*Docidium clavatum* Kütz. Ralfs Brit. Desm. 1848, p. 156, t. 26, f. 3).
Hab. Non-permanent stream, Haflong in the Jatinga valley (33019).
116. **P. irregulare** (Turn.) mihi. (*Docidium irregulare* Turn. Freshw. Alg. E. India 1893, p. 33.)
Hab. In ditch at edge of rice field near Sadiya (32683).

The specimens were not absolutely identical with Turner's description, the apical one-third of the semicells being free from undulations, and the cell-wall fairly distinctly scrobiculate. Otherwise they were quite similar.

117. **P. tessellatum** (Josh.) Lagerh. Kritische Bemerk. 1887, p. 541 (*Docidium tessellatum* Josh. Burm. Desm. 1885, p. 650).

Long. 400 μ ; lat. 40 μ ; lat. apic. 25 μ.

Hab. With the preceding species (32683).

The question has been raised whether *P. tessellatum* (Josh.) Lagerh. is identical with *P. trochiscum* W. & G. S. West (some N. Amer. Desm. 1896, p. 225 ; Alg. Burma 1907, p. 195). In view of the fact that the present specimens were exactly similar to the Alga described by Joshua, this seems very improbable. The Alga from Sadiya had no basal inflation at all, and, as in Joshua's figure, the semicells were gradually attenuated from base to apex.

118. **P. cristatum** (Turn.) Borge, Trop. u. subtrop. Süssw. Chlor. 1899, f. 15. (*Docidium cristatum* Turn. Freshw. Alg. E. India 1893, p. 32, t. 4, f. 7.)

Forma **orientalis** (Turn.) W. & G. S. West. Alg. Burma 1907, p. 195, (*Docidium orientale* Turn. Freshw. Alg. India 1893, p. 31, t. 4, f. 1.)

Hab. With the preceding species. (32683).

119. **P. maculatum** (Turn.) mihi. (*Docidium maculatum* Turn. Freshw. Alg. E. India 1893, p. 31, t. 4, f. 3.) **Pl. 1, fig. 23.**

Zygosporis magnis globosis, diametro 150 μ, membrana laevi, tegumento globoso gelatinoso crasso involuta vestitis ; diam. teg. 320-380 μ.

Long. ca 620 μ ; lat. bas. 60 μ ; lat. apic. 53 μ ; diam. zyg. 150 μ ; cum teg gel. ca 360 μ.

The specimens agreed very well with Turner's description, except that the punctae of the cell-wall were more distant. These, according to Turner are 2-2·3 μ apart, but according to his figure, they are at least 4-5 μ distant. The present specimens agreed with his figure rather than his description in this respect. The cells are also found adhering together to form filaments 3 or 4 individuals long. Zygospores were not infrequent in No. 32683. The conjugating cells often had one very young semicell.

Hab. In ditches of still water, near Sadiya (32658) ; in ditch at edge of rice field (32683).

120. **P. firmum** W. & G. S. West, Alg. Mad. 1895, p. 45, t. 5, f. 41.

Var. **cylindricum** Var. nov.

Var. cellulis gracilioribus, diametro circiter 9-13-plo longioribus, membrana punctis distantioribus praedita.

Long. 550-780μ ; lat. 50-61μ ; lat. ad apic. 38-40μ.

Hab. With the preceding species (32683, 32658) ; in washings of *Lemna* and *Wolffia* from R. Kundil near Sadiya (32672).

Genus **Euastrum** Ehrenb.

121. **E. ansatum** Ralfs Brit. Desm. 1848, p. 85, t. 14, f. 2.

Hab. In ditch at edge of rice field near Sadiya (32683).

Var. **pyxidatum** Delp. Desm. subalp. 1873, p. 103, t. 6, f. 32-34; W. & G. S. West, Brit. Desm. 1905, p. 29.

Hab. With the typical form (32683).

122. **E. spinulosum** Delp. Desm. subalp. 1873, p. 97.

Subspec. **africanum** Nordst. De Alg. et Char. 1880, p. 9, t. 1, f. 16; W. & G. S. West, Freshw. Alg. Ceylon 1902, p. 149, t. 19, f. 21.

Hab. In non-permanent water, Haflong in the Jatinga valley (33019).

Var. **ceylonicum** W. & G. S. West, Freshw. Alg. Ceylon, 1902, p. 149, t. 19, f. 20.

Hab. In ditch at edge of rice field near Sadiya (32683).

123. **E. coralloides** Josh. Burmese Alg. 1886, p. 639, t. 23, f. 10.

Hab. With the preceding species (32683).

124. **E. pulchellum** W. & G. S. West, Freshw. Alg. Ceylon, 1902, p. 153, t. 20, f. 11.

Var. **divisum** W. & G. S. West, Freshw. Alg. Burma, 1907, p. 198, t. 14, f. 7.

Hab. With the preceding species (32683).

125. **E. binale** (Turp.) Ehr. W. & G. S. West, Brit. Desm. 1905, p. 51.

Forma **secta** Turn. Freshw. Alg. E. India 1893, p. 81; W. & G. S. West, Brit. Desm. 1905, p. 53.

Hab. Shallow still water, Haflong (32700).

126. **E. sinuosum** Lenorm. Ralfs Brit. Desm. 1848, p. 85; W. & G. S. West, Brit. Desm. 1905, p. 20.

Hab. With the preceding species (32700).

127. **E. bellum** Nordst. Desm. Brasil, t. 11, f. 6.

Var. **madagascariense** W. & G. S. West. Freshw. Alg. Mad. 1895, p. 49, t. 6, f. 7.

Hab. In ditch at edge of rice field near Sadiya (32683).

128. **E. longicolle** Nordst. Freshw. Alg. New Zeal. 1888, p. 33, t. 3, f. 5.

Hab. With the preceding species (32683).

Var. **capitatum** W. & G. S. West, Freshw. Alg. Ceylon, 1902, p. 148, t. 19, f. 24.

Hab. With the typical form (32683).

The characters of the variety although distinctly present, were not so pronounced as in the specimens from Ceylon.

129. **E. fissum** W. & G. S. West, Freshw. Alg. Ceylon 1902, p. 154, t. 20, f. 17.

Hab. With the preceding species (32683).

130. **E. denticulatum** (Kirchn.) Gay. Note Conj. midi de France, 1884, p. 335; W. & G. S. West, Brit. Desm. 1905, p. 55, t. 39, f. 1-4.

Hab. With the preceding species (32683).

Genus **Euastridium** W. & G. S. West.

131. **E. staurastroides** sp. nov. **Pl. 1, fig. 26.**

E. magnum, circiter 1½-plo longius quam latum, profunde constrictum, sinu lineari angusto ; semicellulis trilobatis, lobi lateralibus semicircularibus, lobo polari subrectangulari ad basin constricto, angulis late rotundatis, apice retuso, tumore mediano instructo, duobus quoque supra isthmum sitis, semicellulis a vertice visis triangularibus, angulis late rotundatis et bilobatis, lateribus retusis ; lobo polari triangulari angulis eis basis semicellularum alternantibus lateribus retusis ; membrana dense scrobiculata, scrobiculis super lobos semicellularum multo majoribus.

Long. 98μ ; lat. 59μ ; lat. lob. pol. 35μ ; lat. isthm. 25μ.

Hab. In ditch at edge of rice field, Sadiya, rare (32683).

Only a few specimens of this species were observed, but the characters seemed very distinctive and sufficiently definite for them to be referred to the genus *Euastridium* as a new species. *E. staurastroides* differs from the first described species of the genus, namely *E. Prainii* W. & G. S. West in its triradial symmetry, in the greater relative size of the polar lobe, and also in its narrow closed sinus. Otherwise the resemblance between the two species is most striking. The discovery of this new species of *Euastridium* gives another indication of the difficulties experienced in drawing sharp lines between the genera of this family, for besides possessing some of the characters of *Micrasterias* and *Euastrum*, *Euastridium* has also something in common with *Staurastrum*. This is perhaps more striking in *Euastridium staurastroides*, with its trigonal symmetry than in *E. Prainii*. In fact, as regards the actual form of the cell, *E. staurastroides* is very similar to *Staurastrum acarides* Nordst. The discovery of this new species, with different characters necessitates a revision of the generic characters.

Euastridium W. & G. S. West char. emend.

Cellulae iis Euastri subsimiles sed non compressae, sinu angusto vel aperto, sine incisura apicali ; semicellulae a fronte visae subtrilobatae, apice retuso ; a latere visae ut a fronte visae, a vertice visae actinomorphicae, 3-8 lobatae.

Genus **Micrasterias** Ag.

132. **M. follacea** Bail. in Ralfs Brit. Desm. 1848, p. 210, t. 35, f. 3 ; Johnson, Spec. Micr., 1894, p. 57, t. 6, f. 1-4.

Long. 70μ ; lat. 71μ; lat. lob. pol. 32μ.

Hab. With the preceding species (32683).

133. **M. Moebii** (Borge) W. & G. S. West, Desm. Singapore 1897, p. 162.
Var. **Burmense**, W. & G. S. West, Freshw. Alg. Burma 1907, p. 201, t. 14, f. 19, 20.
Long. 103μ ; lat 82μ ; lat. lob. pol. 62-66 μ; latisthm. 33μ.
Hab. With the preceding species (32683).

134. **M. pinnatifida** (Kütz.) Ralfs, W. & G. S. West, Brit. Desm. 1905, p. 80.
Hab. At Chittagong (28064).

135. **M. incisa** Bréb. in Ralfs Brit. Desm. 1848, p. 211; in Kütz. Phyc. Germ. 1845, p. 134, Turn. Freshw. Alg. E. India, 1893, p. 89, t. 6, f. 8, 10. (*Holocystis incisa* Wallich Desm. low. Bengal 1860, p. 276, t. 13, f. 4, 5).
Hab. With the preceding species (32683).
Var. **Wallichiana** Turn. Freshw. Alg. E. India 1893, p. 89, t. 6, f. 7, 9.
Hab. With the typical form (32683).
The variety was much more frequent than the type.

136. **M. Crux-melitensis** (Ehr.) Hass. Ralfs Brit. Desm. 1848, p. 73, t. 9, f. 3 ; W. & G. S. West, Brit. Desm. 1905, p. 116.
Long. 92μ ; lat. 92μ ; lat. isthm. 16μ.
Hab. On ditch at edge of rice field near Sadiya (32683).

137. **M. Mahabuleshwarensis** Hobson in Quart. Journ. Micr. Sci. 1863, p. 168.
Var. **Wallichii** (Grun.) W. & G. S. West Brit. Desm. 1905, p. 122 (*M. Wallichii* Grun. 1865).
Forma **bengalica** (Lagerh.) mihi (*M. ampullacea* Mask. var. *bengalica* Lagerh. Desm. Bengal 1888, p. 5, t. 1, f. 2.)
Hab. With the preceding species (32683).
The specimens were considerably smaller than those of Lagerheim, and the two central protuberances rather more distant.

Genus **Cosmarium** Corda.

138. **C. pseudarctoides** Strŏm, Freshw. Alg. Tuddal 1919, p. 31, t. 3, f. 7, 8. (*Cylindrocystis minutissima* Turn. Freshw. Alg. E. India, 1893, p. 16, t. 1, f. 24 ; W. & G. S. West, Brit. Desm. 1904, p. 62).
Long. 15μ ; lat. 6·5μ.
Hab. On the Mountain of Tonglu at 10,000 ft. (27737).

139. **C. cruciferum** DeBary 1858 ; Rabenh. Flor. Eur. Alg. 111, 1868, p. 177. (*Penium cruciferum* (DeBary) Wittr. in W. & G. S. West, Brit. Desm. 1904, p. 100).
Hab. With the preceding species (27737).

140. **C. subpyramidatum** (W. & G. S. W.) Lütk. Gatt. Cyl. 1913 (*Cylindrocystis subpyramidata* W. & G. S. West Freshw. Chlor. Koh Chang 1901, p. 78, t. II, f. 8-11.).
Hab. In shallow still water, Haflong (32700).

141. **C. curtum** (Breb.) mihi (*Dysphinctum curtum* (Bréb.) Näg. Lütk. Kennt. Gatt. ; Pen. 1905, p. 337.) *Penium curtum* Bréb. W. & G. S. West, Brit. Desm. 1904, p. 97.
Hab. In shady pool at 8,500 ft. above Matiana (28684).

142. **C. diplosporum** (Lund.) Lütk. Gatt. Cyl. 1913, p. 227. (*Cylindrocystis diplospora* Lund. W. & G. S. West Brit. Desm. 1904, p. 61).
Hab. In stream at Raxaul on the Nepal border (29361).

143. **C. australe** (Racib.) Lütk. Kenntn. Gatt. Penium 1905, p. 337 (sub nomine *Dysphinctum* Näg. *Penium australe* Racib Desm. Ciast. 1892, p. 367, t. 6, f. 27).
Hab. In shallow still water, Haflong (32700) ; in ditch at edge of rice field near Sadiya (32683).

144. **C. minimum** W. & G. S. West Alg. Madag. 1895, p. 58, t. 8, f. 10.
Long. 12μ ; lat. 10 μ ; lat. isthm. 4·5μ ; crass. 5μ.
Hab. On the Mountain of Tonglu at 10,000 ft. (27737).
The specimens were rather larger, but otherwise exactly similar.

145. **C. pachydermum** Lund. Desm. Suec. 1871, p. 39, t. 15, f. 15 ; W. & G. S. west, Brit. Desm. 1905, p. 139.
Var. **aethiopicum** W. & G. S. West, Brit. Desm. 1905, p. 140.
Long. 58 μ; lat. 40μ ; lat. isthm. 26μ ; crass. 33μ.
Hab. In ditch at edge of rice field near Sadiya (32683).
The specimens were small but exactly typical in form, and the semicells had not the truncate base of var. *minus* Nordst.

146. **C. granatum** Bréb. in Ralfs Brit., Desm. W. & G. S. West., Brit. Desm. 1905, p. 186.
Hab. In the River Dihang between Puak and its tributary the Side River (37689).

147. **C. pseudopyramidatum** Lund. Desm. Suec. 1871, p. 41, t. 2, f. 18 ; W. & G. S. West, Brit. Desm. 1905, p. 201. (*C. pyramidatum* Ralfs. Brit. Desm. 1848, p. 94, t. 15, f. 4, d, e, f.)
Hab. In ditch at edge of rice field near Sadiya (32683).

148. **C. variolatum** Lund. Desm. Suec. 1871, p. 41, t. 2, f. 19 ; W. & G. S. West, Brit. Desm. 1905, p. 203.
Var. **cataractarum** Rac. Desm. Now. 1889, p. 79, t. 5, f. 3.
Hab. In non-permanent water, Haflong (33019).

149. **C. Garrolense** R. & R. Scott. Desm. 1894, p. 101, t. 2, f. 4 ; W. & G. S. West, Brit. Desm. 1908, p. 12.
Long. 26μ ; lat. 20μ ; lat. isthm. 7μ ; crass. 14μ.
Hab. On the Mountain of Tonglu at 10,000 ft. (27737).
This is the first extra-British record for this species.

150. **C. connatum** Bréb. in Ralfs Brit. Desm. 1848, p. 103, t. 17, f. 10 ; W. & G. S. West, Brit. Desm. 1908, p. 25.

Long. 70μ ; lat. 50μ ; lat. isthm. 42μ.

Hab. In shallow still water, Haflong (32700).

151. **C. quadratum** Ralfs Brit. Desm. 1848, p. 92, t. 15, f. 1a ; W. & G. S. West Brit. Desm. 1908, p. 57.

Forma **Willei** W. & G. S. West, Brit. Desm. 1908, p. 59.

Hab. On the Mountain of Tonglu at 10,000 ft. (27737).

152. **C. Sinostegos** Schaarschm. Magyar Desm. 1882, p. 266, t. 1, f. 12 ; W. & G. S. West, Brit. Desm. 1908, p. 79.

Var. **obtusius** Gutw. W. & G. S. West, Brit. Desm. 1908, p. 79, t. 71, f. 40.

Hab. With the preceding species (27737).

153. **C. angulosum** Bréb.

Var. **concinnum** (Rab.) W. & G. S. West, Brit. Desm. 1908, p. 94.

Hab. Calcutta (28184).

154. **C. Portianum** Arch. W. & G. S. West, Brit. Desm. 1908, p. 165.

Hab. In stream, Raxaul on the Nepal border (29361).

155. **C. maculatum** W. B. Turner, Alg. E. India 1893, p. 49, t. 7, f. 31, t. 8, f. 68 ; W. &. G. S. West, Alg. Ceylon, 1902, p. 163.

Hab. In pool at 8,500 ft. above Matiana (28064).

156. **C. laticeps** Grun. in Rabenh. Flor. Eur. Alg. 1868, p. 168 ; Nordst. Alg. New Zealand 1888, p. 57, t. 6, f. 10.

Hab. On the Mountain of Tonglu at 10,000 ft. (27737).

157. **C. subauriculatum** W. & G. S. West, Alg. Mad. 1895, p. 55, t. 6, f. 31 ; Alg. Tangan, 1907, p. 115.

Hab. In shallow still water Haflong (32700) ; in ditch at edge of rice field near Sadiya (32683).

This Desmid is now known to occur in Madagascar, Central Africa, Siam, North-Eastern India, and Central China.

158. **C. distichum** Nordst.-Freshw. Alg. N. Zealand. 1888 p. 51, t. 5, f. 16 ; W. & G. S. West, Brit. Desm. 1908, p. 215.

Forma paullo minor, zygosporis magnis sphaericis, mamillis numerosis praeditis, mamillis aculeis parvis singulis instructis.

Pl. 11, figs. 5, 6.

Long. 28 μ ; lat. 25 μ ; lat. isthm. 6 μ ; crass. 17 μ ; diam. zyg. sine acul. 34μ ; cum acul. 38μ.

Hab. In ditch at edge of rice field near Sadiya (32683).

159. **C. binum** Nordst. in Wittr. & Nordst. Alg. exc. 1880, no. 383, fasc. 21, 1889, p. 39 ; W. & G. S. West, Brit. Desm. 1908, p. 246.

Hab. In ditch at edge of rice field near Sadiya (32683) ; in the River Dihang between Puak and its Tributary the Side River (37689).

160. **C. speciosum** Lund. Desm. Suec. 1871, p. 34, t. 3, f. 5 ; W. & G. S. West, Brit. Desm. 1908, p. 247.

Subsp. **meridionale** Carlson, Süssw. Alg. Antarkt. etc. 1913, p. 41, t. t, f. 12-14.

Long. 38μ ; lat. 28μ ; lat. isthm. 13μ ; crass. 16μ.

Hab. On the Mountain of Tonglu at 10,000 ft. (27737).

The specimens were smaller and had 10 marginal crenations instead of 14, otherwise they were exactly similar to Carlson's figures of specimens from South Georgia.

161. **C. hexalobum** Nordst. Desm. Spetsb. 1872, p. 33, t. 7, f. 16 ; W. & G. S. West, Brit. Desm. 1908, p. 257.

Var. **minus** R. & B. Scott. Desm. 1894, p. 103, t. 1, f. 12.

Long. 66μ ; lat. 57μ ; lat. isthm. 20μ ; crass. 31μ.

Hab. With the preceding species (27737).

The specimens were nearer var. *minus* in their form, but were very much larger.

162. **C. margaritatum** (Lund.) R. & B. W. & G. S. West, Brit. Desm. 1911, p. 18.

Hab. Near Nataran (27976).

163. **C. crenatum** Ralfs Brit. Desm. 1848, p. 96, t. 15, f. 7, bc ; W. & G. S. West, Brit. Desm. 1911, p. 35.

Hab. In shady pool at 8,500 ft. above Matiana (28684).

164. **C. Quadrum** Lund. Desm. Suec. 1871, p. 25, f. 2, t. 11 ; W. & G. S. West, Brit. Desm. 1911, p. 20.

Hab. In non-permanent stream, Haflong (33019).

165. **C. crenatum** Ralfs Brit. Desm. 1848, p. 96, t. 15, f. 7, b, c ; W. & G. S. West, Brit. Desm. 1911, p. 35.

Hab. On the Mountain of Tonglu at 10,000 ft. (27737).

166. **C. tessellatum** (Delp.) Nordst. Alg. et Char. 1880, p. 7. (*Dysphinctum tessellatum* Delp. Desm. subalp. 1877, p. 136, t. 21, f. 10-13).

Hab. In ditch at edge of rice field near Sadiya (32683).

167. **C. cyathiforme** W. & G. S. West, N. Amer. Desm. 1896, p. 248, t. 15, f. 9.

Hab. With the preceding species (32683).

Genus **Xanthidium** Ehrenb.

168. **X. Burkillii** W. & G. S. West, Alg. Burma 1907, p. 210, t. 15, f. 10.

Long. sine sp. 50 μ ; cum sp. 80μ ; lat. sine sp. 55μ ; cum sp. 85μ ; lat. isthm. 28μ ; crass. 28μ.

Hab. In ditch at edge of rice field near Sadiya (32683).

169. **X. trilobum** Nordst. Desm. Brasil. t. 111, f. 35.

Var. **indicum** var. nov. **Pl. 11, fig. 7.**

Var. minor, aculeis longioribus, ad angulas geminis non-furcatis ; cellulis a vertice visis quadratis angustioribus quam in forma typica, polis valde retusis, angulis productis et aculeis divergentibus.

Long. sine acul. 36μ ; cum. acul. 54μ ; lat. sine acul. 38μ ; cum acul. 48μ ; lat. isthm. 9μ ; crass. 18μ.

Hab. With the preceding species (32683).

This variety differs from the typical form in its simple and longer spines, which are surmounted on the distinctly prolonged angles. In the end view the cell is relatively narrower, and is of rather different form.

It should be compared with *X. calcarato-aculeatum* Hier. (Schmidle in Engl. Botan. Yahrb. xxvi, p. 41, t. 3, f. 5) which has rather different spines and *X. antilopaeum* (Bréb.) Kütz., var. *incertum* Schmidle (ibid. xxxii, p. 71, t. 2, f. 5), from which it differs in its simpler spines with the prolonged hollow bases.

170. **X. hastiferum** Turn. New Rare Desm. 1885, p. 938, t. 15, f. 20. (*X. antilopaeum* Kütz. var. *angulatum* Josh. in Journ. Linn. Soc. Bot. 1886, p. 643, t. 24, f. 16.)

Var. **javanicum** Turn. Freshw. Alg. E. India 1893, p. 100 (*X. antilopaeum* f. *javanica* Nordst. De Alg. et Char. 1880).

Long. sine sp. 39μ ; cum sp. 60-70μ ; lat. sine sp. 39μ ; cum sp. 58μ ; lat. isthm. 9μ ; crass. 17μ.

Hab. With the preceding species (32683).

171. **X. Raciborskii** Gutw. Alg. Java 1902, p. 589, t. 37, f. 28. **Pl. 1, figs. 12-14.**

Long. 50μ ; lat. 48μ ; lat. isthm. 22μ ; crass. 29μ.

Hab. Shallow still water, Haflong (32700).

The specimens were somewhat variable, sometimes almost passing into forma *protracta* Gutw. loc. cit. t. 38, f. 29.

172. **X. lepidum** W. & G. S. West, Alg. Ceylon 1902, p. 159, t. 20, f. 22, 23.

Long. 39μ ; lat. 27μ ; lat. isthm. 8μ ; crass. 19μ.

Hab. In ditch at edge of rice field near Sadiya (32683).

Genus Arthrodesmus Ehrenb.

173. **A. convergens** Ehr. Inf. 1858, p. 152, t. 10, f. 18 ; W. & G. S. West, Brit. Desm. 1911, p. 106.

Cum zygosporis.

Hab. In ditch at edge of rice field near Sadiya (32683).

174. **A. curvatus** Turn. Freshw. Alg. E. India, 1893, p. 135, t. 11, f. 31, 33, t. 12, f. 2, 7, 13, 15.

Long. 43μ ; lat. sine sp. 45μ ; cum sp. 85μ ; lat. isthm. 14μ.

Hab. With the preceding species (32683).

175. **A. fusiformis** W. & G. S. West, Alg. Burma 1907, p. 212, t. 15, f. 4.

Hab. In ditch at edge of rice field near Sadiya (32683).

Genus **Staurastrum** Meyen.

176. **S. apiculatum** Bréb. Liste Desm. 1856, p. 142, t. 1, f. 23.
Long. 26μ ; lat. 34μ ; lat. isthm. 7μ.
Hab. With the preceding species (32683).

177. **S. connatum** R. & B. Jap. Desm. 1886, p. 237. (*S. dejectum* var. *connatum* Lund. 1871, p. 60).
Hab. With the preceding species (32683).

178. **S. leptodermum** Lund. Desm. Suec. 1871, p. 58, t. 3, f. 26.
Var. **Ikapoe** (Schmidle) W. & G. S. West, Alg. Burma 1907, p. 211, t. 15, f. 5, 6. (*S. Ikapoe* Schmidle in Engl. Botan. Yahrb. 1902, p. 74).
Long. sine sp. 40 μ ; cum sp. 55 μ ; lat. 31 μ ; lat. isthm. 23 μ.
Hab. With the preceding species (32683).

179. **S. unicorne** Turn. Alg. E. India 1893, p. 107, t. 15, f. 16.
Long. 23 μ ; lat. sine sp. 23 μ ; cum sp. 33-37 μ ; lat. isthm. 6·5 μ.
Hab. With the preceding species (32683).

180. **S. cuspidatum** Bréb. in Ralfs Brit. Desm. 1848, p. 122, t. 21, f. 1, t. 33, f. 10.
Forma **incurva** Heimerl, Desm. alp. 1891, p. 604, t. 5, f. 19.
Hab. With the preceding species (32683).

181. **S. bifidum** Bréb. in Ralfs Brit. Desm. 1848, p. 215.
Hab. With the preceding species (32683).
The spines were, as a rule, never in the same plane (cf. W. & G. S. West, Alg. Ceylon, 1902, p. 176).

182. **S. striolatum** (Näg.) Arch. in Pritch. Infus. 1861, p. 740 ; W. & G. S. West, Brit. Desm. 1911, p. 177.
Hab. Non-permanent stream, Haflong (33019).

183. **S. punctulatum** Bréb. in Ralfs Brit. Desm. 1848, p. 133, t. 22, f. 1.
Var. **Kjellmani** Wille. W. & G. S. West, Brit. Desm. 1911, p. 182.
Long. 23 μ ; lat. 16-19 μ ; lat. isthm. 8 μ.
Hab. Shallow still water Haflong (32683) ; (25390).
The specimens were much smaller than usual.

184. **S. dilatatum** Ehr. Inf. 1838, p. 143, t. 10, f. 13 ; W. & G. S. West, Brit. Desm. 1911, p. 172.
Long. 32·5 μ ; lat. 26 μ ; lat. isthm. 11 μ.
Hab. On the Mountain of Tonglu at 10,000 ft. (27737).
The specimens were usually triangular in the end view, although one specimen was observed in which one semicell was triangular and the other quadrangular.

185. **S. tetracerum** Ralfs Brit. Desm. 1848, p. 137, t. 23, f. 7.
Hab. In ditch at edge of rice field near Sadiya (32683).

186. **S. Cerastes** Lund. Desm. Suec. 1871, p. 69, t. 4, f. 6.
Var. **ceylanicum** W. & G. S. West, Alg. Ceylon 1902, p. 184, t. 22, f. 4.
Long. 32 μ ; lat. cum pr. 40 μ ; lat. bas. semicell. 9 μ ; lat. isthm. 7 μ.
Hab. In ditch at edge of rice field near Sadiya (32683).

187. **S. Hantzschii** Reinsch Spec. Alg. Fung. 1866, p. 129, t. 22D, f. 4, 6.
Var. **cornutum** Turn. Alg. E. India 1893, p. 120, t. 15, f. 23.
Long. sine proc. 20 μ ; cum pr. 29 μ ; lat. sine pr. 16 μ ; cum pr. 24 μ ; lat. isthm. 5 μ ; long. proc. 5 μ.
Hab. With the preceding species (32683).

188. **S. tohopecaligense** Wolle 1885 ; Freshw. Alg. U. S. 1887, p. 45, t. 59, f. 4, 5. (*S. nonanum* Turn. Freshw. Alg. E. India 1893, p. 119, t. 15, f. 14).
Var. **trifurcatum** W. & G. S. West, Alg. Madag. 1895, p. 80, t. 9, f. 8.
Long. sine proc. 32 μ ; cum pr. 47 μ ; lat. sine pr. 32 μ ; cum pr. 42 μ ; lat. isthm. 9 μ.
Hab. With the preceding species (32683).

189. **S. pinnatum** Turn Alg. E. India 1893, p. 115, t. 13, f. 27.
Var. **subpinnatum** (Schmidle) W. & G. S. West Alg. Ceylon 1902, p. 182 (*S. subpinnatum* Schmidle in Flora lxxxii, 1896, p. 311, t. 9, f. 20).
Long. 22 μ ; lat. cum pr. 28 μ ; lat. isthm. 9 μ.
Hab. With the preceding species (32683).

190. **S. subgracillimum** W. & G. S. West, Some N. Amer. Desm. 1896, p. 263, t. 17, f. 3, 4.
Hab. With the preceding species (32683).

191. **S. cyclacanthum** W. & G. S. West, Alg. Ceylon 1902, p. 189, t. 22, f. 18.
Hab. With the preceding species (32683).

192. **S. galeatum** Turn. Alg. E. India 1893, p. 122, t. 14, f. 3, 9. 10 ; W. & G. S. West, Alg. Ceylon 1902, p. 190, t. 22, f. 19. (*S. subprotractum* Schmidle in Engler, Bot. Yahrb. xxvi, 1898, p. 55, t. 4, f. 3.)
Long. 26 μ ; lat. cum pr. 37 μ ; lat. isthm. 6·5 μ.
Hab. With the preceding species (32683).

193. **S. contectum** Turn. Alg. E. India 1893, p. 111, t. 15, f. 20.
Long. 34 μ ; lat. 35 μ ; lat. isthm. 9 μ.
Hab. With the preceding species (32683).

194. **S. Wallichii** Turn. Freshw. Alg. E. India 1893, p. 117, t. 13, f. 24.
Var. **aequale** var. nov. **Pl. 11, fig. 9, 10.**
Var. processibus basalibus cum superioribus aequelongis ; isthmo latiore.
Long. sine pr. 31 μ ; cum pr. 45 μ ; lat. sine pr. 29 μ ; lat. cum pr. 40 μ ; lat. isthm. 16 μ.
Hab. With the preceding species (32683).

The specimens were very similar to Turner's figures, differing chiefly in the somewhat broader isthmus, and in the processes of the lower whorl, which instead of being shorter, were about equal in size to those of the upper whorl. In some specimens, both whorls of processes were very much shortened and sometimes dilated. The end view was invariably 5-angled.

Genus **Oocardium** Näg.

195. **O. stratum** Nag. Gatt. einz. Alg. 1849; Senn in Botan Zeitung 1899, p. 81.

Var. minor var. nov. **Pl. 11, figs. 21-24.**

Var. forma typica multo minor.

Zygosporis polyhedricis vel rectangularibus, membrana laevi, sed mamillis magnis irregularibus instructa.

Long. cell. 7-8 μ; lat. 12-14 μ; crass. 7·5-9·5 μ; diam. zyg. 15-20 μ.

Hab. Small stream under Pongging in the Abor Hills (36169).

The Alga was forming a stony stratum about 1 mm. in thickness over certain leaves, which had apparently fallen into the stream, and had become covered with a thin film consisting of filamentous Bacteria, fungal hyphae and other debris. The leaf and debris were quite encased in the calcareous mass. In the upper part of the stratum the characteristic radiating stony tubes of the *Oocardium* could be recognised, with the tiny cells at their upper aperture.

The cells were little more than half their usual size, and zygospores were very plentiful, all stages in the fusion of the gametes and the formation of the zygospore being present. The young zygospores were at first greenish, but later became deep olive-brown.

It is peculiar that although this extraordinary Desmid has been known for so many years its zygospores have only just been found. It is particularly gratifying that they have at last been discovered, since it is now proved beyond all doubt that the Alga is placed in its proper systematic position.

Oocardium stratum has previously only been known from certain localities in Central Europe, and its discovery in India is particularly interesting.

Genus **Onychonema** Wallich.

196. **O. laeve** Nordst. Desm. Brasil. 1869, p. 206, t. 3, f. 34.

Var. microcanthum Nordst. De Alg. et Char. 1880, p. 3.

Long. 13 μ; lat. cum sp. 23-25 μ.

Hab. In ditch at edge of rice field near Sadiya (32683).

Genus **Hyalotheca** Kutz.

197. **H. Burmensis** W. & G. S. West Alg. Burma 1907, p. 225, t. 12, f. 1-4. **Pl. 11, fig. 8.**
Cum zygosporis.
Long. cell 11-15 μ ; lat. 19 μ ; long. zyg. 29 μ ; lat. zyg. 22 μ.
Hab. With the preceding species (32683).

The wall of the zygospore was provided with smaller and much more numerous mamillae than those figured by W. & G. S. West. Possibly their zygospores were not quite mature.

198. **H. mucosa** (Dillw.) Ehr.
Var. **minor** Delp.
Hab. On floating leaves in marsh Kawkareik (30372).

Genus **Desmidium** Ag.

199. **D. Baileyi** (Ralfs) Nordst. De Alg. et Char. 1880. (*Aptogonum Baileyi* Ralfs Brit. Desm. 1848, p. 208, t. 35, f. 1.
Hab. In ditch at edge of rice field near Sadiya (32683).

OEDOGONIACEAE.

Genus **Oedogonium** Link.

200. **O. plagiostomum** Wittr. Hirn. Monogr. Oedog. 1900, p. 100.
Long. cell. veg. 30 μ ; ca 5-plo longior. ; crass. oog. 57-60 μ ; long. 60 μ ; diam. oosp. 50 μ.
Hab. With the preceding species (32683).

201. **O. taphrosporum** Hirn & Nordst. in Hirn Monogr. Oedog. 1900, p. 133.
Lat. cell. veg. 28 μ ; diam. oog. 78-85 μ ; long. oog. 95-105 μ; diam. oosp. 70-73 μ.
Hab. With the preceding species (32683).

This species has only been previously found in Brazil. Only a fragment was observed in the present case, and the male plants were not seen, but it agreed so well that there seemed no doubt as to its identity.

202. **O. acmandrium** Elfv. in Hirn Monogr. Oedog. 1900, p. 150.
Lat. cell. veg. 8 μ ; crass. oog. 30 μ.
Hab. With the preceding species (32683).

203. **O. mammiferum** Wittr. in Hirn Monogr. Oedog. 1900, p. 175, t. 28, f. 165.
Lat. cell veg. 4·5 μ ; ca 4-plo longior. ; crass. oog. 22-25 μ ; long. 20 μ ; crass. oosp. 14 μ ; long. 10 μ.
Hab. In shallow still water Haflong (32700).

The plants were rather smaller than usual, and were very plentiful. The projections of the oogonia were almost straight on their upper edge but biundulate at their lower margin.

204. **O. spirale** Hirn Monogr. Oedog. 1900, p. 201, t. 33, f. 206.
Var. **acutum** W. & G. S. West, Alg. Ceylon 1902, p. 128, t. 17, f. 3-5.
Lat. cell. veg. 25-28 μ ; lat. oog. 56 μ ; long. 60 μ ; diam. oosp. 47 μ ; lat. nannandr. 9 μ ; long. 82-92 μ.
Hab. In ditch at edge of rice field near Sadiya (32683).

205. **O. Wolleanum** Wittr. in Hirn Monogr. Oedog. 1900, p. 220, t. 37, f. 226.
Lat. cell. veg. 15-20 μ ; crass. cell. suffult. 40 μ ; crass. oog. 50-55 μ ; long. 65-70 μ.
Hab. With the preceding species (32683).
The plants were a little smaller but in other respects exactly similar.

206. **O. Borisianum** (Le Cl.) Wittr. in Hirn Monogr. Oedog. 1900, p. 217, t. 36, f. 223.
Lat. cell. veg. 16 μ ; crass. cell. suffult. 33 μ ; crass. oog. 37 μ.
Hab. With the preceding species (32683).

207. **O. oblongum** Wittr. in Hirn Monogr. Oedog. 1900, p. 185, t. 29, f. 181.
Hab. On the Mountain of Tonglu at 10,000 ft. (27737).

208. **O. cyathigerum** Wittr. in Hirn Monogr. Oedog. 1900, p. 252.
Var. **perfecta** Hirn. Monogr. Oedog. 1900, p. 254, t. 43, f. 268.
Crass. cell. veg. 30-35 μ ; crass. oog. 79 μ ; long. oog. 110 μ ; diam. oosp. 76 μ.
Hab. In ditch at edge of rice field near Sadiya (32683).

209. **O. tapeinosporum** Wittr. in Hirn Monogr. Oedog. 1900 ; p. 297, t. 23, f. 117.
Crass. cell. veg. 2-3 μ ; crass. oog. 15-16 μ ; long. 17-19 μ ; crass. oosp. 14 μ ; long. 8 μ.
Hab. With the preceding species (32683).

210. **O. calvum** Wittr. in Hirn Monogr. Oedog. 1900, p. 316, t. 50, f. 323.
Crass. fil. veg. 7-9 μ ; crass. oog. 27 μ ; long. oog. 25 μ.
Hab. In water under rocks, at Sembadew in the Sipna valley (31345) ; in the Sipna stream (31268).
Sterile species of *Oedogonium* occurred in Nos. 26847, 28064 and 28825.

Genus **Bulbochaete** Ag.

211. **B. elatior** Pringsh. in Hirn Monogr. Oedog. 1900, p. 321, t. 51, f. 327.
Crass. cell. veg. 15-17 μ ; crass. oog. 40-43 μ ; long. 35 μ.
Hab. In ditch at edge of rice field near Sadiya (32683).

212. **B. nana** Wittr. in Hirn Monogr. Oedog. 1900, p. 349, t. 57, f. 363.
Crass. oog. 24 μ ; long. 40 μ.
Hab. With the preceding species (32683).

OPHIOCYTIACEAE.

Genus **Ophiocytium** Näg.

213. **O. cochleare** (Eichwald) A. Br. Lemmermann in Hedw. 1899, p. 30, t. 3, f. 10-12.
Hab. At Chittagong (28064); with the preceding species (32683).

TRIBONEMACEAE.

Genus **Tribonema** Derbes & Sol.

214. **T. bombycinum** (Ag.) Derbes and Sol. Mém. sur physiol. Alg. 1856, p. 18, t. 4, f. 16-21.
Forma **tenuis** Hazen in Mem. Torr. Bot. Club 1902, p. 185.
Hab. In various springs near Kakarhatti at 2,500 ft.—2,800 ft. (28842).

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DESCRIPTION OF THE PLATES.

FIGS. 1-3.—*Microchæte uberrima* sp. nov. x. 510. Fig. 2, Spore formation.
FIG. 4.—*M. uberrima* f. *minor* ×510.
FIGS. 5, 6.—*Cosmarium distichum* Nordst. forma. Fig. 5, zygospore ×510; fig. 6, ×810.
FIG. 7.—*Xanthidium trilobum* Nordst. var. *indicum* var. bov. ×510.
FIG. 8.—*Hyalotheca Burmensis* W. & G. S. West, zygospore, ×510.
FIGS. 9, 10.—*Staurastrum Wallichii* Turn. var. *æquale* bar. nov. × 510.
FIG. 11.—*Zygnema* sp. Akinetes ×510.
FIGS. 12-14.—*Xanthidium Raciborskii* Gutw. ×510.
FIGS. 15-16.—*Hantzschia amphioxys* (Ehr.) Grun. Auxospores ×510.
FIGS. 17-20.—*Debarya desmid ioides* W. & G. S. West, var. *orientale* var. nov. ×510.
FIGS. 21-24.—*Oocardium Stratum* Nag. var. *minor* van. nov. ×810.
FIG. 25.—*Pleurotaenium maculatum* (Turn.) mihi. Zygospore ×142.
FIG. 26.—*Euastridium staurastroides* sp. nov. ×510.

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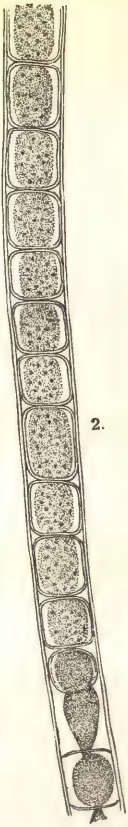
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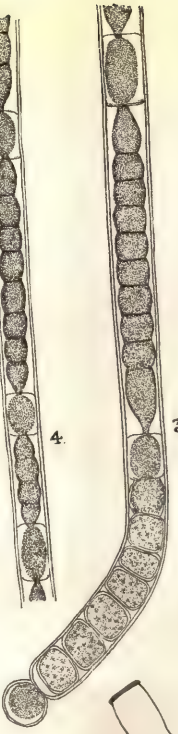
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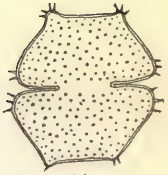
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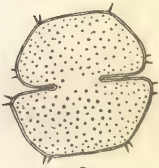
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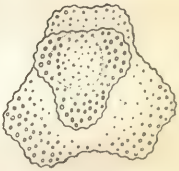
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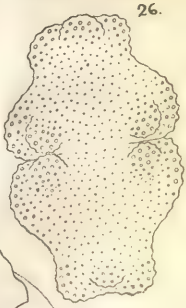

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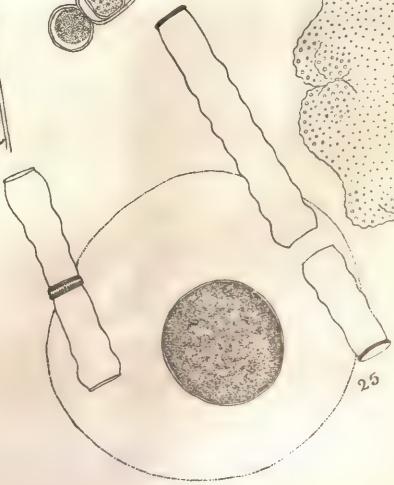
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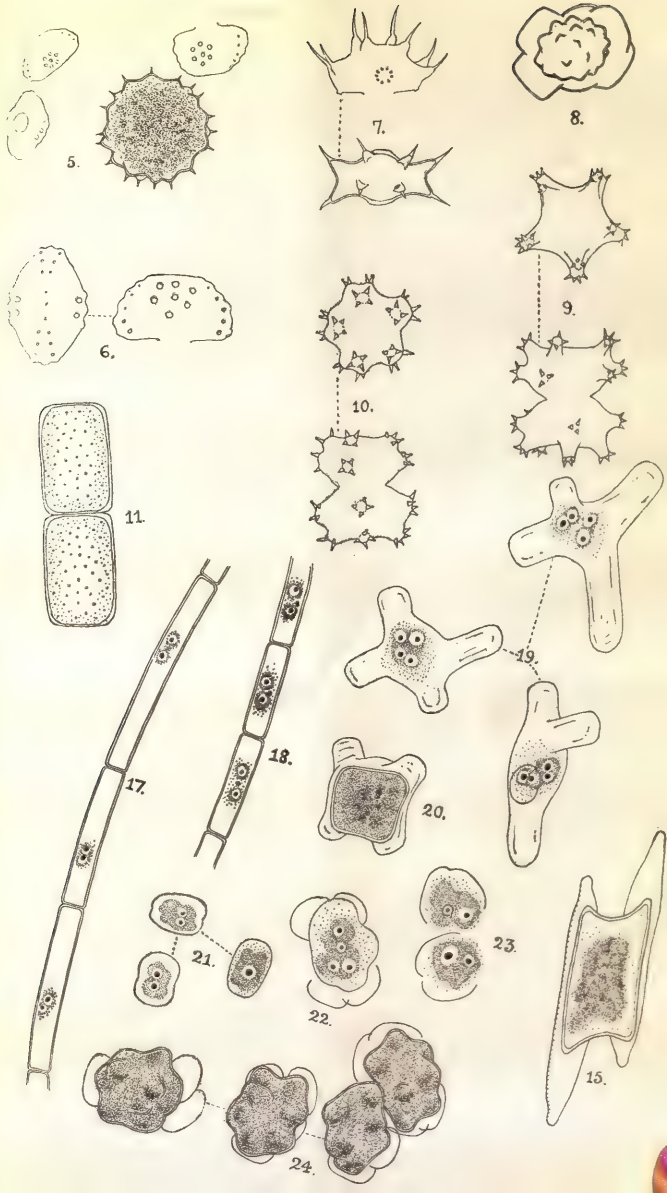
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MOSSES COLLECTED IN GILGIT, etc., BY J. GARRETT AND W. LILLIE.

By

H. N. DIXON, M.A., F.L.S.

The mosses included in the following list were sent me by the Rev. D. Lillie for determination, having been collected by Messrs. Garrett and Lillie during a visit to the Gilgit Agency. The mosses of this district are little known, and as the list contains a few species new to science it seemed very desirable to put them on record. So far as I know the only mosses hitherto recorded from this district are those collected by J. F. Duthie, and published by Brotherus in Act. Soc. sc. fennicae xxiv, No. 2 (1898).

The following particulars written by Mr. W. Lillie explain the route taken and the topography of the collecting grounds.

In the summer of 1924 permission was given by the Political Agent Gilgit, through the British Resident in Kashmir, for Messrs. Garrett and Lillie to visit, for purposes of scientific study, the Gilgit Agency, the most northerly district of the State of Kashmir and of the Indian Empire. The route chosen was to follow the military road up the Kunkar Valley (a tributary of the Jhelam) in the North-West Frontier Province; one of the most beautiful and richly wooded valleys of the western Himalayas, and the source of the well known Hazara timber. The whole valley was rich in mosses, especially round a lake near the Bahusar Pass into the Gilgit Agency, where at a height of some 13,000 ft. several good species were found. (The Frontier police provided a guard over the pass, which is occasionally the scene of raids). The Agency itself, a desert stretch along the Indus Valley, with rocky mountains on either side, has in the regions near the river almost no vegetation. Indeed there were only three places where mosses were found, in the pine-woods below the Bahusar Pass, in a side valley which was ascended to some considerable height in the company of the Assistant Political Agent of Chilas, and in the irrigated tracts around the Gilgit cantonments.

The route taken from the Indus Valley into Kashmir was by ascending the Astor Nala to the Kamri Pass (over 13,000 ft.). Within a march of the Indus, pine-woods were searched, and the next four marches through the District of Astor, and under the shadow of Nanga Parbat (26,600 ft.) showed a country that was interesting in every way to the

botanist, and with an exquisite profusion of wild flowers, including many of our most familiar English garden flowers. From the Kamri, after crossing the valley of the Kishenganga (another tributary of the Jhelam), the expedition descended from the Raj-changan Pass to the Wular Lake and the main Kashmir Valley.

LIST OF MOSSES.

Dicranaceæ.

Distichium capillaceum (Sw.) Bry. eur.

Upper Indus and Astor Valleys, Gilgit, 4,000—8,000 ft. (1099, 1100, 1101), Kamri Pass and Kishenganga Valley, Kashmir, 8,000—14,000 ft. (1122).

Ceratodon purpureus (L.) Brid.

Kamri Pass and Kishenganga Valley, Kashmir, 8,000—14,000 ft. (1123, etc.).

Oncophorus gracillimus Dixon sp. nov. (Plate I).

Minutissimus generis. Caulis *vix 4mm. longus.* Corticola. Caules aggregati, fusco-virides; folia conferta, patentia, flexuosa, siccitate apice contorto; e basi *subquadrata, vaginante, superne dilatata,* raptim in subulam canaliculatam elongatam flexuosam linearem sensim angustatam acutam integram vel apice remote denticulato contracta; costa validiuscula, percurrens. Cellulae basilares elongate lineares, parietibus tenuiusculis, inanes, pellucidae, alares haud mutatae; superne sensim abbreviatae; eae totius laminae minutae, quadratae vel rotundatae, laeves, juxtacostales saepe elongatae, breviter rectangulares; parietibus incrassatis; marginales 1-2 seriebus saepe paullo bistratosae.

Autoicus; flos ♂ infra femineam situs, parvus, paucifolius. Folia perichaetialia caulinis similia, parte vaginante autem magis elongata. Seta 1 *cm. alta, tenuis;* theca *minuta,* deoperculata 1 mm. longa, subglobosa, gibbosa, haud striata, basi strumosa; exothecii rete *perlaxum,* e cellulis late rectangularibus vel hexagonis, parietibus tenuibus sed collenchymaticis instructum. Operculum haud visum. Peristomium intense rubrum, sat magnum, e dentibus inferne in membranam humillimam cohaerentibus, infra latis sapra cito in crura singula vel bina,

pallida, longa, filiformia contractis; *per totam longitudinem usque fere ad apicem striolatis*, laevibus nec papillosis; ad basin trabeculis internis sat validis prominentibus praeditis. Spori circa 18μ.

Hab. On wood, Kamri Pass and Kishenganga Valley, Kashmir, 8,000—14,000 ft., Aug. 1924 (1138).

This little plant might be described as a miniature of *O. Wahlenbergii*, of which it has almost exactly the leaves, on a smaller scale. Only a few capsules were seen, all deoperculate, ovate-rotund, gibbous above, with a very distinct struma. The peristome teeth appear to be mostly undivided above, though some are forked.

FISSIDENTACEÆ.

Fissidens perplexans Dixon sp. nov.*(Plate I).

§ Bryoidium. Autoicus. Fl. ♂ in axillis foliorum superiorum plantae femineae siti. Sat gracilis; caulis 5-6 mm. altus; folia multijuga, parum conferta, patentia, sicca *minime mutata, parum falcata*; inferiora circa I mm., juxta perichaetium 1·5 mm. longa; breviter late oblongo-lanceolata; suprema lingulato-lanceolata, breviter, late acuta; lamina dorsalis inferne valde angustata, *plerumque longe ante apicem desinens*. Costa inferne *valida*, rufescens, *superne valde attenuata*, cum apice evanida. Folia inferiora plerumque omnino elimbata, superiora *limbo tenerrimo hic illic praedita, raro toto ambitu, nisi parte laminae dorsalis inferiore*, circumdata; *integerrima*. Cellulae superiores parvae, 5—8 μ latæ, subhexagonæ, *distinctæ*, læves, parietibus tenuibus, firmis.

Fructus terminalis, seta *perbrevis*, 1-2 mm. alta, theca minima, erecta, æqualis, collo brevi, distincto.

Hab. Valley of Kunkar R., alt. 3,000—6,500 ft., Hazara Distr., N.-W. Front. Prov., July, 1924 (997).

A distinct species, marked by the extremely narrow border, often wanting in many of the leaves, and when present very irregularly produced. It is not more strongly marked on the vaginant lamina than on the other parts of the leaf, being perhaps usually developed most strongly on the upper part of the dorsal lamina. The cells are not at all of the Semilimbidium character, and in spite of the poorly developed border the species is undoubtedly a Bryoidium.

Fissidens grandifrons Brid.

Valley of Kunkar R., Hazara Distr., N.-W. Front. Prov., 3,000—6,500 ft. (1014). Upper Indus and Astor Valleys, Gilgit, 4,000—8,000 ft. (1115).

POTTIACEÆ.

Hymenostomum obscurissimum Dixon sp. nov. (Plate I).

Cæspites parvi, perdensi, atrofusci, vix I cm. alti. Caules valde conferti, ramosi, densissime foliosi ; folia madida erecto-patentia, sicca torquata ; caulina ad 2 mm. longa basi latiore late oblongo-lanceolata apice lato, *obtuso vel brevissime, minute apiculato ;* perconcava, marginibus superioribus late involutis. Costa *validiuscula*, 60-80μ lata, superne parum angustata. Cellulae superiores *valde obscuræ et opacæ*, minutæ, læves ; inferiores *raptim majores, perpellucidæ*, partem basilarem totam occupantes, infimæ juxtacostales breviter anguste rectangulares, reliquæ omnes *subquadratæ vel brevissime rectangulares*, seriebus longitudinalibus regulariter dispositæ, parietibus firmis, haud incrassatis. Folia ramea multo minora, angustiora.

Seta *brevis*, circa 3 mm. alta ; theca deoperculata parva, ovata, æqualis, gymnostoma.

Hab. Valley of Kunkar R., alt. 3,000—6,500 ft., Hazara Distr., N.-W. Front. Prov., July, 1924 (1000).

With something of the habit of *H. tortile* this is at once distinct in the broader, shorter leaves, very obtuse, with very marked areolation, the basal part, reaching nearly half the length of the leaf, being extremely pellucid, of small cells, almost equal throughout the base, while the upper ones become abruptly small, obscure and very opaque, forming a great contrast with the lower.

Hymenostylium aurantiacum Mitt.

Valleys of Thak and Baner tributaries, Chilas ; 4,000—13,000 ft. (1077). Upper Indus and Astor Valleys, Gilgit, 4,000—8,000 ft. (1102 ; 1104).

Trichostomum Lillici Dixon sp. nov. (Plate I).

E gracillimis generis. Caulis haud 5 mm. altus, laxiuscule foliosus, viridis ; folia subcomosa, patentia, plus minusve recurvata, *fragilia*, sicca plus minusve crispata ; *parva*, vix 3 mm. longa, *perangusta*, ·25-·35 mm. lata, e basi *brevissima, vix notata, haud dilatata, lineali-lanceolata*, sensim acuminata, peracuta, vel latiuscule acuta, apice sæpe diffracto ; marginibus omnino planis, integris ; costa apud basin 60-70 μ lata, pallida, superne sensim angustata, concolor, plerumque breviter excurrens, dorso *superne muriculata.* Cellulæ superiores distinctæ, chlorophyllosæ, *seriebus longitudinalibus pulchre dispositæ*, rotundato-hexagonæ, circa 8μ latæ, leniter papillosæ, parietibus tenuibus, basilares *perpaucæ*, breviter rectangulares, pellucidæ.

Seta ?brevis. Theca ?parva, anguste cylindrica. Cetera ignota.

Hab. Valley of Kunkar R., Hazara Distt., N.-W. Front. Prov., alt. 3,000-6,500 ft., July, 1924 (998).

A minute species with the habit and leaf form of a small Hymenostylium; indeed the leaves are so closely similar to some species of that genus and of Anœctangium,—the muriculate back of the nerve at apex adding to the resemblance—that I have hesitated to describe it as a Trichostomum. The upper areolation is, however, distinctly Trichostomoid, and not as in those genera, and I think it certainly belongs here. A single detached capsule is undoubtedly Barbuloid, but it cannot be certain that it belongs to this plant, which was closely intermixed with other mosses, especially a Weisia or Hymenostomum somewhat similar in appearance. By a most unfortunate accident the whole of Rev. D. Lillie's material, which he had forwarded to me in order if possible to solve this problem, miscarried in the post, and was lost.

Timmiella anomala (Bry. eur.) Limpr.

Valley of Kunkar R., Hazara Distr., N.-W. Front. Prov., 3,000—6,500 ft. (1005, 1006). Valleys of Thak and Baner tributaries, Chilas, 4,000—13,000 ft. (1079, 1080, 1081, 1089).

Didymodon rufescens (Hook.) Broth.

Valley of Kunkar R., Hazara Distr.. N.-W. Front. Prov., 3.000—6,500 ft. (999).

Didymodon rubellus (Hoffm.) Bry. eur.

Valley of Kunkar R., Hazara Distr., N.-W. Front. Prov., 3,000—6,500 ft. (1002). Kamri Pass and Kishenganga Valley, Kashmir, 8.000—14,000 ft. (1124).

Didymodon Wallichii (Mitt.) Broth.

Kamri Pass and Kishenganga Valley, Kashmir, 8,000—14,000 ft. (1125).

Barbula horricomis C.M.

Valley of Kunkar R., Hazara Distr., N.-W. Front. Prov., 3,000—6,500 ft. (1003).

Barbula javanica Doz. & Molk. nov. var. robusta Dixon.

Stirps foliorum structura cum *B. javanica* omnino congruens, *multo autem robustior, caulibus* 2-3 *cm. altis, foliis* 2·5-3 *mm. longis.*

Valley of Kunkar R., Hazara Distr., N.-W. Front. Prov., 3,000—6,500 ft. (1004, 1018). The latter is much water-worn, indicating that the variety is a more or less aquatic form.

Barbula sp. Near *B. gregaria* (Mitt.), but with oblong-lingulate, obtuse leaves, and nerve only faintly muricate at back above. Probably a new species, but best left undetermined *pro tem.*

Valley of Kunkar R., Bahusar Pass, N.-W. Front. Prov., 6,500—13,000 ft. (1052).

Desmatodon suberectus (Drumm.) Limpr.

Valleys of Thak and Baner tributaries, Chilas, 4000—13,000 ft. (1078).

Tortula Brandisii (C.M.) Broth.

Valley of Kunkar R., Hazara Distr., N.-W. Front. Prov., 3,000—6,500 ft. (1007, 1008, 1009, 1012). Bahusar Pass, N.-W. Front. Prov., 6,500—13,000 ft. (1059). This species was also collected by Mr. W. Lillie in 1923, on Takht-i-Suleiman, 5,000—6,000 ft., Srinagar, Kashmir (793). I do not know that it has been collected since its original gathering. I have compared the plants with an original specimen in the Brit. Museum, and find them to agree exactly, with the single exception that C. Mueller describes his species as synoicous, and I have found no synoicous flowers on these specimens, which appear dioicous. As however species of Zygotrichia are frequently polyoicous, I do not think this need cast any doubt on the identity with *T. Brandisii.**

GRIMMIACEÆ.

Grimmia apocarpa nov. var. subpellucida Dixon.

Atro-viridis; folia breviter *pilosa;* cellulæ superiores perdensæ, obscuræ, medianæ *quadratæ, pellucidæ*, parietibus *nec* incrassatis nec *sinuosis;* basilares quadratæ, *inanes, parietibus rectis, tenuibus.*

Valley of Kunkar R., Bahusar Pass, N.-W. Front. Prov., 6,500—13,000 ft. (1051). Valleys of Thak and Baner tributaries, Chilas, 4,000—13,000 ft. (1076).

The areolation is unusually pellucid, both at base and in mid-leaf, and I did not suspect an *apocarpa* form until No. 1076 showed fruit which seems inseparable from this species. It is a marked variety. The piliferous leaves exclude *G. alpicola.*

* A specimen gathered later by Mr. Lillie in Kashmir, shows a ♂ flower close to and almost within the perichætium.

Grimmia commutata, Hueben.

Valley of Kunkar R., Hazara Distr., N.-W. Front. Prov., 3,000—6,500 ft. (1010).

Grimmia campestris Burch.

Upper Indus and Astor Valleys, Gilgit, 4,000—8,000 ft. (1103).

FUNARIACEÆ.

Funaria hygrometrica (L.) Sibth.

Valleys of Thak and Baner tributaries, Chilas, 4,000—13,000 ft. (1082).

BRYACEÆ.

Pohlia elongata Hedw.

Kamri Pass and Kishenganga Valley, Kashmir, 8,000—14,000 ft. (1130).

Mnio bryum sp. Probably *M. albicans* (Wahl.).

Valleys of Thak and Baner tributaries, Chilas, 4,000—13,000 ft. (1095).

Leptobryum pyriforme (L.) Wils.

Valleys of Thak and Baner tributaries, Chilas, 4,000—13,000 ft. (1074, 1086).

? **Brachymenium indicum** (Doz. and Molk.) Bry. jav. Sterile, and not certainly determinable.

Valley of Kunkar R., Hazara Distr., N.-W. Front. Prov., 3,000—6,500 ft. (1011).

Bryum cellulare Hook

Valley of Kunkar R., Hazara Distr., N.-W. Front. Prov., 3,000 ft. (1015).

Bryum ventricosum Dicks.

Bahusar Pass, N.-W. Front. Prov., 6,500—13,000 ft. (1073). Upper Indus and Astor Valleys, Gilgit ,4,000—8,000 ft. (1110, 1113).

Bryum cæspiticium L.

In numerous localities from all the districts.

Bryum Blindii Bry. eur.

Bahusar Pass, N.-W. Front. Prov., 6,500—13,000 ft. (1058).

Bryum argenteum L.

Valley of Kunkar R., Hazara Distr., N.-W. Front. Prov., 3,000—6,500 ft. (1017). Bahusar Pass, 6,500—13,000 ft. (1056). Valleys of Thak and Baner tributaries, Chilas, 4,000—13,000 ft. (1085).

MNIACEÆ.

Mnium rostratum Schrad.

Valleys of Thak and Baner tributaries, Chilas, 4,000—13,000 ft. (1087).

BARTRAMIACEÆ.

BARTRAMIA sp. § Vaginella. Synoicous. But capsules too immature for determination. Valleys of Thak and Baner tributaries, Chilas, 4,000—13,000 ft. (1088).

Philonotis fontana (L.) Brid., forma.

Bahusar Pass, N.-W. Front. Prov., 6,500—13,000 ft. (1063).

Philonotis seriata Mitt.

Kamri Pass and Kishenganga Valley, Kashmir, 8,000—14,000 ft. (1126).

POLYTRICHACEÆ.

Catharinea undulata W. & M. **var. ambigua** Naw. The form with synoicous or paroicous inflorescence, and aggregate capsules.

Kamri Pass and Kishenganga Valley, Kashmir, 8,000—14,000 ft. (1131).

Polytrichum juniperinum Willd.

Several gatherings from different localities.

LESKEACEÆ.

Pseudoleskea atrovirens Bry. eur.

Kamri Pass and Kishenganga Valley, Kashmir, 8,000—14,000 ft. (1133).

Lescuræa saxicola (Bry. eur.) Mol.

Bahusar Pass, N.-W. Front. Prov., 6,500—13,000 ft. (1070, 1071, 1072).

HYPNACEÆ.

Homomallium simlaense (Mitt.) Broth.

Valley of Kunkar R., Hazara Distr., N.-W. Front. Prov., 3,000—6,500 ft. (1016, 1023).

Amblystegium compactum (C.M.) Aust.

Valleys of Thak and Baner tributaries, Chilas, 4,000—13,000 ft. (1094). This appears to be new to Asia, and is a considerable extension of its geographical range.

Distr. Europe; N. America.

Hygroamblystegium filicinum (L.) Broth.

In numerous gatherings from all the districts. A forma laxa from Chilas (1091, 1092), was rather marked.

Hygrohypnum palustre (Huds.) Lœske.

Upper Indus and Astor Valleys, Gilgit, 4,000—8,000 ft. (1117).

Stereodon Vaucheri (Lesq.) Lindb.

Upper Indus and Astor Valleys, Gilgit, 4,000—8,000 ft. (1119).

Pleuropus euchloron (Bruch) Broth.

Valley of Kunkar R., Hazara Distr., N.-W. Front. Prov., 3,000—6,500 ft. (1023 p.p.).

A few stems of this very distinct and rare species, hitherto unknown east of Persia.

Distr. Caucasus; West Persia.

Brachythecium Buchanani (Hook.) Jaeg.

Valley of Kunkar R., Hazara Distr., N.-W. Front. Prov., 3,000—6,500 ft. (1024).

Brachythecium emodi-glareosum Broth.

Valley of Kunkar R., Hazara Distr., N.-W. Front. Prov., 3,000—6,500 ft. (1025).

Brachythecium indico-populeum Dixon sp. nov. (Plate I).

Habitu *B. populeo* persimile. Differt costa plerumque in acuminis basi evanida, foliis perichætialibus *argute dentatis*, seta *ubique minute distincte muriculata*.

Hab. Kunkar Valley, Bahusar Pass, N.-W. Front. Prov., 6500—13,000 ft., July-Aug., 1924 (1060), type. Ibidem (1067). Kamri Pass and Kishenganga Valley, Kashmir, 8,000—14,000 ft., Aug. 1924 (1137), forma robusta, latifolia.

Of the *B. populeum* group this differs at once from that species as well as from *B. glabratum* Broth. and *B. spurio-populeum* Broth. in the seta finely muriculate in all its length, and in the sharply denticulate perichætial bracts. No. 1137 is of very different habit, with large broad leaves, but structurally agrees exactly both in vegetative and fruiting characters.

Brachythecium obsoletinerve Dixon sp. nov. (Plate I.)

Subgen. Velutinium § Julacea Broth.

Densissime cæspitosum; pallide viride, intus fuscescens; parum nitidum; caules intertexti, breves, dense pinnatim ramosi, ramis *brevibus*, circa 4 mm. longis, *apice decurvatis*.

Folia caulina parva, 1-1·25 mm. longa, deltoideo-ovata, cito *breviter* anguste acuminata, plicata, marginibus *planis*, superne *minute denticulatis;* costa *pertenuis*, sæpe obsoleta fere, ad medium folium raro attingens; cellulæ superiores *parvæ*, *angustissimæ;* basin versus paullo latiores, alares *plures subquadratæ*, *pellucidæ*.

Folia ramea angustiora, *oblongo-lanceolata;* plerumque *falcata*, *profunde plicata*, sensim breviter acuminata, cetera caulinis similia.

Autoicum. Perichætium *parvum;* folia *parva*, erecta, e basi late ovata raptim in subulam *breviusculam*, *subulatam*, *integram* contracta; marginibus ad subulæ basin sæpe dentibus paucis magnis præditis. Seta *brevis*, vix 1 cm. longa, ubique scabra. Theca *parva*, *breviter gibbosoovata;* operculum conicum, acutum.

Hab. Tragbol, Kashmir, 12,000 ft. Aug. 1919, coll. R. R. Stewart (1910), type. Valleys of Thak and Baner tributaries, Chilas, 4,000—13,000 ft., Aug. 1924, coll. Garrett & Lillie (1097), co-type.

A very distinct species, allied to *B. curvatulum* Broth., which differs in the recurved margin, strongly denticulate above, the very long subula of the perichætial leaves, etc.

The nerve is exceedingly narrow and thin, sometimes almost invisible, and often lost in a fold of the leaf.

The co-type differs somewhat in habit, having the leaves less falcate, and branches less curved at the tip, very julaceous with the densely

crowded leaves; the seta is fully 1 cm. long, and the lid rather obtusely pointed. In all the more important characters, however, it agrees with the type.

Brachythecium rivulare Bry. eur.

Upper Indus and Astor Valleys, Gilgit, 4,000—8,000 ft (1114).

Oxyrrhynchium rusciforme (Neck.) Warnst.

Valley of Kunkar R., Hazara Distr., N.-W.Front. Prov., 3,000—6,500 ft. (1021).

EXPLANATION OF PLATE I.

Fig. 1. *Oncophorus gracillimus*. *a*. Plants × 1 (left moist, right dry.) *b*, *b'*, leaves × 10. *c*, leaf-base ×15. *d*, capsule ×12.

Fig. 2. *Fissidens perplexans*. *a*, plant ×12. *b*, *b'*, border of two leaves near apex ×200.

Fig. 3. *Hymenostomum obscurissimum*. *a*, *a'*, leaves ×10. *b*, upper marginal cells ×200. *c*, basal do. ×200. (the walls are drawn rather too thick).

Fig 4. *Trichostomum Lilliei*. *a*, *a'*, leaves ×20. *b*, *b'*, leaf apices ×40. *c*, upper cells ×200. *d*, basal cells ×200.

Fig. 5. *Brachythecium obsoletinerve*. *a*, plant ×1. *b*, branches ×2. *c*, stem leaf, *d*, branch leaf ×20. *e*, basal angular cells ×100. *f*, perichætium ×15.

Fig. 6. *Brachythecium indico-populeum*. *a*, stem ×1. *b*, *b'*, stem and branch leaves ×20. *c*, basal angular cells of stem leaf ×100. *d*, perichætium ×15.

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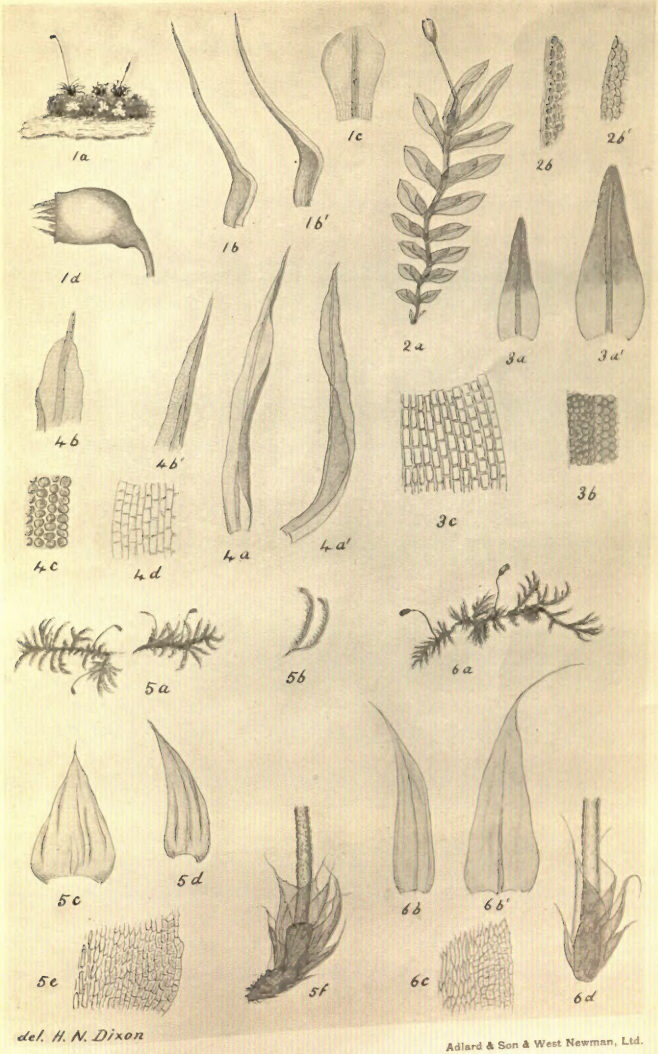

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